"ECU communication protocol": general information

The "available channels list" you find inside Race Studio 2 "Configuration" window is inferred from the ECU's communication protocol.
The communication protocol includes all the available channels of a generic Pectel/DTA etc. ECU. The channels you may sample among the "available channels list" are function of the ECU model, of the ECU configuration and of the wiring.

The number of channels that your data logger is able to sample depends on the ECU type and configuration, on the wiring and on the sensors connected to the ECU itself. To know which channels are acquired by your AIM logger, please check your Logger channel page in Race Studio 2 software, where all recorded channels are shown.

Please note: for specific information on ECUs pinout and wirings always refer to Your ECU user manual. Here follow some examples of ECU configuration and connection with AIM loggers; these information come from tests made by AIM research and development board or from our dealers or customers that have verified them.

"Supported ECUs": general information

AIM loggers support both CAN and RS232 communication protocol ECUs.
To know if your ECU model and communication protocol is supported, please refer to the table next page:

CAN protocol	RS232 serial protocol
• **AIM** – Proprietary CAN Protocol	• **AEM** – Mod. EMS30-1050
• ***BMW – Mod. PT6	• **AIM** – Proprietary RS232 protocol
• ***BMW – Mod. Z4 Coupè	• **Autronic** – Mod. SM2_V190/1
• *****BMW_Mini** – Mod. BMW_Mini	• **Autronic** – Mod. SMC_V191
• *****Bosch** – Mod. Audi	• **Autronic** – Mod. SM2_V193/195
• **Bosch** – Mod. MS3	• **Autronic** – Mod. SM4
• **Bosch** – Mod. MS4	• **Carmo** – Mod. AFI_2003
• *****Bosch** – Mod. MS4 997	• **Carmo** – Mod. AFI_2005
• **Bosch** – Mod. BoschVWGroup	• **DTA** – Mod. P8
• **Bosch** – Mod. Porsche 911 (Mod. 996)	• **DTA** – Mod. P8V29
• *****Bosch** – Mod. Porsche 911 (Mod. 997)	• **DTA** – Mod. P8V30
• *****Bosch** – Mod. Seat Leon Cup	• **DTA** – Mod. S60
• **Brightwater** – Mod. TyrePress4Sensor	• **EFI USA** – Mod. 2.1
• *****Dallara** – Mod. VW16_FSI	• *****Electromotive** – Mod. Tec3
• *****Delphi** – Mod. Mefi 4B	• **EMS** – Mod. Stinger
• *****Ducati Energia –** Mod. Terra Modena	• *****EMS** – Mod. Stinger V123
• **EFI EUROPE** – Mod. EURO 1	• *****EMS** – Mod. Stinger 4
• *****EFI EUROPE** – Mod. EURO 4	• *****EMS** – Mod. Stinger 8860
• **EFI EUROPE** – Mod. EURO 6	• **GEMS** – Mod. OMEX
• **EFI EUROPE** – Mod. EURO 12	• **Haltech** – Mod. E11V2
• **EFI EUROPE** – Mod. EURO 96	• **Hondata** – Mod. K-Pro
• *****EFI EUROPE** – Mod. EURO 6/12 New	• *****Hydra** – Mod. EMS Nemesis
• *****Electromotive** – Mod. TecGT	• **MBE** – Mod. 967
• **Ford** – Mod. Focus PZEV 2003/2004	• **MBE** - Mod. 970
• **Ford** – Mod. Focus 2005/2007	• **MoTec** – Mod. M4 (DataSet5 and DataSet3)
• **Ford** – Mod. FR500C	• **MoTec** – Mod. M 48(DataSet5 and DataSet3)
• **Ford** – Mod. Mustang S197	• *****MoTec** – Mod. M4-M48 (DataSet5 19200)
• **Lotus** – Mod. Elise/Exige	• **MoTec** – Mod. M8 (DataSet1)
• **Marelli** – Customer Protocol	• **Nira** – Mod. I3+
• **Marelli** – Mod. FR2000	• **Pectel** – Mod. T2
• *****Marelli** – Mod. FR2000 JPN	• **Pectel** – Mod. T6
• **Marelli** – Mod. FR1600	• **Performance Electronics** – Mod. PE-ECU 1
• *****Marelli** – Mod. MF4 for Ducati 998 Racing Kit (no stock bike)	• **Racetech** – Mod. ENGMAN_18
• ***** Marelli** – Mod. MMTC2000	• **Racetech** – Mod. EM_36
• **Marelli** – Mod. SRA	• **Sybele** – Mod. RS232
• **Marelli** – Mod. Toyota	• **Walbro** – Mod. Benelli
• *****Marelli** – Mod. ToyotaA	• **Walbro** – Mod. Benelli 04
• **Marelli** – Mod. ToyotaB	• **Walbro** – Mod. Bimota
• **Mazda** – Mod. RX8 (Denso)	• **Walbro** – Mod. HPUH1
• *****Mazda** – Mod. MX5 (Denso)	• **Wolf** – Mod. WOLF3D
• *****MBE** – Mod. 992	
• **MecTronic** – Mod. MK_E4	
• **MoTec** – Mod. M400	
• **MoTec** – Mod. M400 – 1M	
• **MoTec** – Mod. M600	
• **MoTec** – Mod. M600 – 1M	
• **MoTec** – Mod. M800	
• **MoTec** – Mod. M800 – 1M	
• **MoTec** – Mod. M800 – 1M V3	

• ***Nissan – Mod. 350Z • **Racetech** – Mod. EM_46 • **SEAT –** Mod. ECU_1 • **Sodemo** – Mod. EV_11 • **Subaru –** Mod. SSM • **Sybele** – Mod. CAN • **TMS** – Mod. TyrePress • **TMS** – Mod. TyrePress4Sensor	

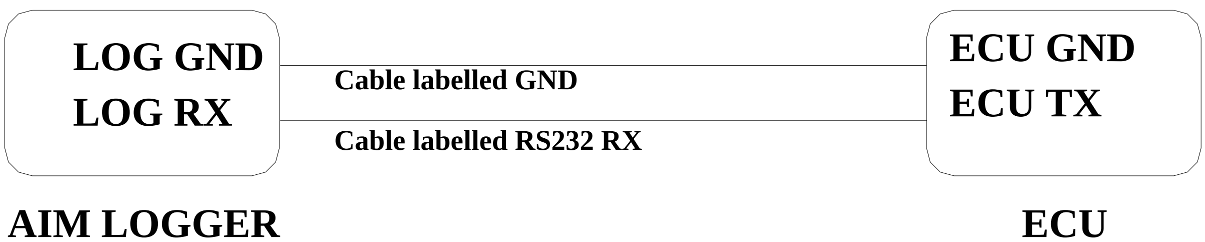
Note: (***)- ***Connection chapter under preparation.***

ECU connection: general information

Aim instruments can communicate with the ECU both with a **CAN** protocol and with an **RS232** protocol, using respectively a **CAN cable** or a **Serial cable**.
The connection is usually done as below explained:

- **Serial Communication Set-Up**

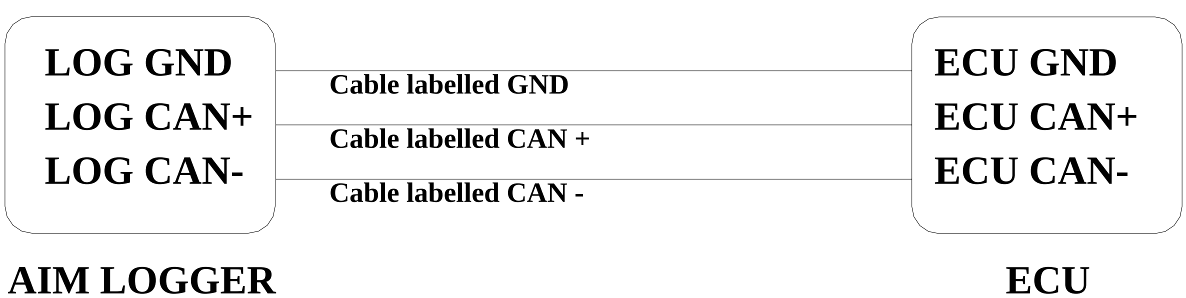
The usual connection is as follows: please connect cable called **RS232 RX** with **ECU TX** and cable called **GND** with **ECU GND** as in the figure below.



Please note: this setup is all right for almost all ECU communicating with **RS232** protocol; there can anyway be ECUs that need **LOG TX** cable to be connected to **ECU RX** too. For further information, please see paragraphs in the following pages, related to the single ECUs.

- **CAN Communication Set-Up**

The connection is as follow: please connect cable labelled **CAN+** with **ECU CAN+**, cable labelled **CAN-** with **ECU CAN-** and cable called **GND** with **ECU GND** as in the figure below.



Please note: once your ECU is connected to the AIM Logger, you need to set it in the logger configuration in **Race Studio 2** software.

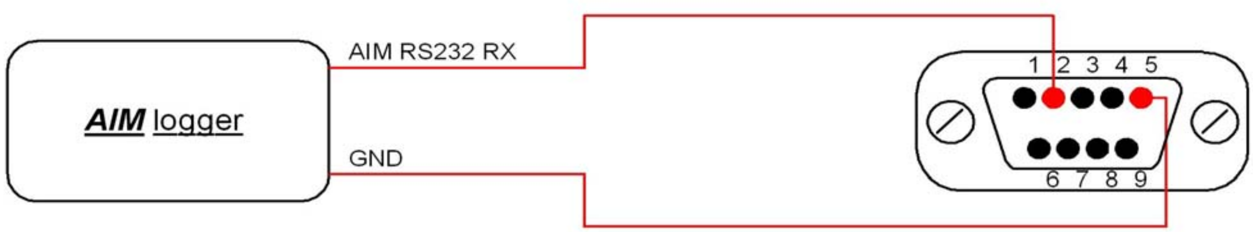
"AEM – EMS30-1050"

The ECUs are equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECUs themselves.

- **Connection With AIM Data logger**

AIM loggers can be connected to AEM ECUs via DB9 serial port according to the following wiring scheme:

- Connect the AIM cable labeled "RS 232 RX" with DB9 male Pin 2



AEM – EMS30-1050

ECU_1	AEM_RPM	RPM
ECU_2	AEM_LOAD	ENGINE LOAD
ECU_3	AEM_TPS	THROTTLE POSITION
ECU_4	AEM_AIR_TEMP	INTAKE AIR TEMPERATURE
ECU_5	AEM_WATER_TEMP	WATER TEMPERATURE
ECU_6	AEM_ADCR11	CUSTOM FREE CHANNEL
ECU_7	AEM_ADCR13	CUSTOM FREE CHANNEL
ECU_8	AEM_ADCR14	CUSTOM FREE CHANNEL
ECU_9	AEM_ADCR17	CUSTOM FREE CHANNEL
ECU_10	AEM_ADCR18	CUSTOM FREE CHANNEL
ECU_11	AEM_ADCR15	CUSTOM FREE CHANNEL
ECU_12	AEM_ADCR16	CUSTOM FREE CHANNEL
ECU_13	AEM_BATTERY	BATTERY VOLTAGE
ECU_14	AEM_LAMBDA_#1	LAMBDA VALUE#1
ECU_15	AEM_LAMBDA_#2	LAMBDA VALUE#2
ECU_16	AEM_SPEED	VEHICLE SPEED
ECU_17	AEM_GEAR	ENGAGED GEAR
ECU_18	AEM_ERROR1	ERROR SIGNAL
ECU_19	AEM_ERROR2	ERROR SIGNAL

CAN Asynchronous Messaging

AIM technique is referred to as Asynchronous messaging, basically the whole stream of parameters (all 35 Bytes) is splitted up into 8 bytes-length packets, that are sequentially inserted into CAN messages and in a given order. The data packets do not contain a specific identifier, they are just in a predefined order. At the receiving node the device looks for the Header information (this is a constant contained in the datastream), when this is seen the device knows that next message is the start of the datastream and all subsequent CAN messages will contain the given parameters in the predefined order.
In this way the CAN system is simply a carrier for seemingly highly variable data under a single base addresses and the software handlers at either end know how to breakdown and reassemble these separate packets of data into a continuous and complete datastream.
The CAN bus has a bitrate of 1Mbit/s and the CAN Buffer Identifier is 11bit.(CAN 2.0a)
CheckSum is the sum of all bytes of the structure up to and including marker byte 3.

Byte	Signal	Units	Scaling
0:1	RPM	RPM	1RPM
2:3	Wheel Speed	Km/h	0.1km/h
4:5	Oil Pressure	Bar	0.1Bar
6:7	Oil Temperature	Deg C	0.1Deg C
8:9	Water Temperature	Deg C	0.1Deg C
10:11	Fuel Pressure	Bar	0.1Bar
12:13	Battery Voltage	Volts	0.01Volts
14:15	Throttle Angle	%	0.1%
16:17	Manifold Pressure	mBar	1mBar
18:19	Air Charge Temperature	Deg C	0.1Deg C
20:21	Exhaust Gas Temperature	Deg C	1Deg C
22:23	Lambda	Lambda	0.001 La
24:25	Fuel Temperature	Deg C	0.1Deg C
26:27	Gear	0=neutral,1=first,2=second,etc	
28:29	Errors	ECU-specific error flags	
30	Number of Data Bytes	30	
31	Marker Byte 1	FC	
32	Marker Byte 2	FB	
33	Marker Byte 3	FA	
34	CheckSum		

AIM – PROT_CAN

ECU_1	AIM_RPM	RPM
ECU_2	AIM_WHEELSPEED	VEHICLE SPEED
ECU_3	AIM_OILPRESS	OIL PRESSURE
ECU_4	AIM_OILTEMP	OIL TEMPERATURE
ECU_5	AIM_WATERTEMP	WATER TEMPERATURE
ECU_6	AIM_FUELPRESS	FUEL PRESSURE
ECU_7	AIM_BATTVOLT	BATTERY VOLTAGE
ECU_8	AIM_TPS	THROTTLE POSITION
ECU_9	AIM_MAP	MANIFOLD PRESSURE
ECU_10	AIM_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_11	AIM_EXHAUST_TEMP	EXHAUST TEMPERATURE
ECU_12	AIM_LAMBDA	LAMBDA VALUE
ECU_13	AIM_FUELTEMP	FUEL TEMPERATURE
ECU_14	AIM_GEAR	ENGAGED GEAR
ECU_15	AIM_ERRORS	ERROR SIGNAL

RS232 – Serial protocol

The data stream is standard RS232 at 19200,n,8,1. It consists of a number of short packets. Packets are sent on 10 ms ticks. Note that this does not mean that there is a packet sent every 10 ms tick – there is a pattern which repeats once a second to achieve the channel frequencies listed below, and there are some unused ticks where nothing is transmitted. Each packet consists of 5 bytes. The first byte is the channel number, the second is always $A3_H$, the third and fourth are the channel value, high byte first. The fifth is the sum of the preceding four bytes.

Signal	Channel #	Freq [Hz]	Transform	Units
RPM	1	10	y=x	RPM
Wheel speed	5	10	y=x/10	Km/h
Oil pressure	9	5	y=x/1000	Bar
Oil temp	13	2	y=x/10-100	Deg C
Water temp	17	2	y=x/10-100	Deg C
Fuel pressure	21	5	y=x/1000	Bar
Battery voltage	33	5	y=x/100	Volts
Throttle angle	45	10	y=x/10	Deg
Manifold press	69	10	y=x	MBar
Air charge temp	97	2	y=x/10-100	Deg C
Exhaust temp	101	2	y=x/10-100	Deg C
Lambda Sensor	105	10	y=x/1000	Lambda
Fuel temp	109	2	y=x/10-100	Deg C
Gear	113	5	y=x	0=rev, 1=neutral, 2=first, 3=second, etc
Errors	125	2	-	ECU-specific error flags

AIM – PROT_UART

ECU_1	AIM_RPM	RPM
ECU_2	AIM_WHEELSPEED	VEHICLE SPEED
ECU_3	AIM_OILPRESS	OIL PRESSURE
ECU_4	AIM_OILTEMP	OIL TEMPERATURE
ECU_5	AIM_WATERTEMP	WATER TEMPERATURE
ECU_6	AIM_FUELPRESS	FUEL PRESSURE
ECU_7	AIM_BATTVOLT	BATTERY VOLTAGE
ECU_8	AIM_THROTANG	THROTTLE POSITION
ECU_9	AIM_MANIFPRESS	MANIFOLD PRESSURE
ECU_10	AIM_AIRCHARGETEMP	INTAKE AIR TEMPERATURE
ECU_11	AIM_EXHTEMP	EXHAUST TEMPERATURE
ECU_12	AIM_LAMBDA	LAMBDA VALUE
ECU_13	AIM_FUELTEMP	FUEL TEMPERATURE
ECU_14	AIM_GEAR	ENGAGED GEAR
ECU_15	AIM_ERRORFLAG	ERROR SIGNAL

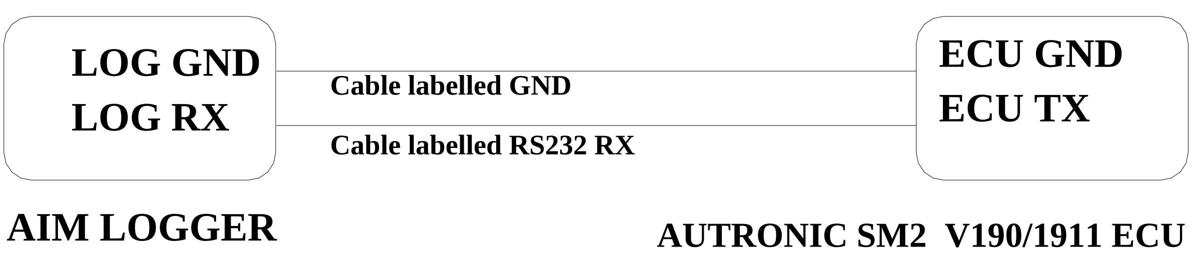
"AUTRONIC – SM2_V190/191 / SM2_V193/195 / SMC_V191"

- **Serial Communication Set-Up**

The ECU is has a serial communication protocol (RS 232) and is equipped with a 36 pins connector whose pinout is reported below used to communicate parameters to an external data logger, or to configure the ECU itself.

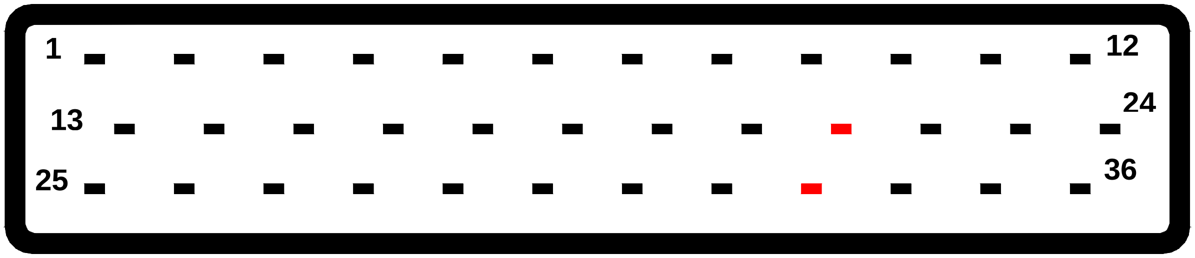
- **Connection With AIM Data logger**

To connect Your AIM logger to the ECU, please connect AIM cable labelled as "**RS232RX**" with **pin 33** of the ECU (**ECU TX**), AIM cable labelled as "**GND**" with **pin 21** of the ECU (**ECU GND**) as in the draw below.



Pin	Function	Comments
21	GND	
33	RS232TX	

Here below is shown the 36 pins connector and its pinout.



Pin	FUNCTION
1	Ignition O/P 7
2	Injector O/P 6
3	Injector O/P 4
4	Injector O/P 2
5	Injector O/P 1
6	Coolant Temp I/P
7	O2 I/P
8	Ref Trigger I/P
9	Serial I/O Rxd
10	Ignition O/P 4
11	Ignition O/P 2
12	Auxiliary O/P
13	ECU +12V supply
14	Injector O/P 8
15	Injector O/P 5
16	Injector O/P 3
17	Sensor GND
18	Throttle Position I/P
19	Throttle Position Supply
20	Trigger Supply
21	**Serial I/O GND**
22	Ignition O/P 3
23	Diagnostic O/P
24	Fuel Pump O/P
25	+12V Pump Rly Supply
26	+12V Aux O/P Supply
27	ECU GND
28	ECU GND
29	Ignition SW I/P
30	Air Intake Input I/P
31	Trigger GDN
32	Cyl Pulse Trigger I/P
33	**Serial O/P Txd**
34	GND
35	Ignition O/P 1
36	Ignition O/P

AUTRONIC – SM2_V190/1 / SMC_V191

ECU_1	AUTR_RPM	RPM
ECU_2	AUTR_SPEED	VEHICLE SPEED
ECU_3	AUTR_DRVWHEEL_SPD	WHEEL SPEED
ECU_4	AUTR_WATER_TEMP	WATER TEMPERATURE
ECU_5	AUTR_CHARGE_TEMP	AIR/FUEL MIX TEMPERATURE
ECU_6	AUTR_INTAKEAIR_TEMP	INTAKE AIR TEMPERATURE
ECU_7	AUTR_EXHAUST_PRESS	EXHAUST PRESSURE
ECU_8	AUTR_MANIF_PRESS	MANIFOLD PRESSURE
ECU_9	AUTR_THROTPOS	THROTTLE POSITION
ECU_10	AUTR_INJECT_TIME	INJECTION TIME
ECU_11	AUTR_IGNIT_ANG	IGNITION ADVANCE ANGLE
ECU_12	AUTR_AF_RATIO	AIR/FUEL RATIO
ECU_13	AUTR_BATT_VOLT	BATTERY VOLTAGE

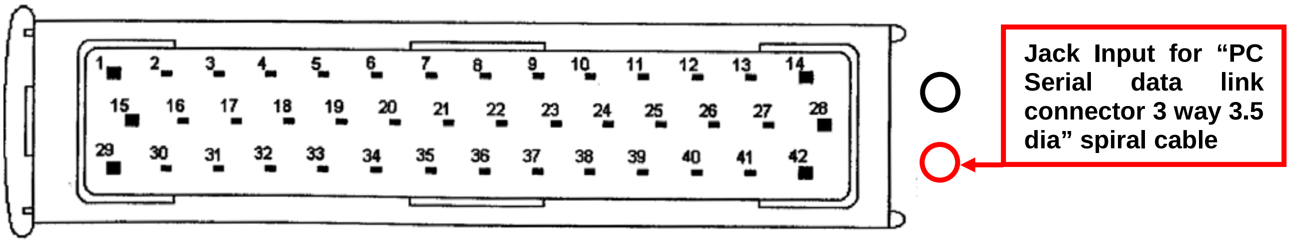
AUTRONIC – SM2_V193/195

ECU_1	AUTR2_RPM	RPM
ECU_2	AUTR2_SPEED	VEHICLE SPEED
ECU_3	AUTR2_DRVWHEEL_SPD	WHEEL SPEED
ECU_4	AUTR2_WATER_TEMP	WATER TEMPERATURE
ECU_5	AUTR2_CHARGE_TEMP	AIR/FUEL MIX TEMPERATURE
ECU_6	AUTR2_INTAKEAIR_TEMP	INTAKE AIR TEMPERATURE
ECU_7	AUTR2_EXHAUST_PRESS	EXHAUST PRESSURE
ECU_8	AUTR2_MANIF_PRESS	MANIFOLD PRESSURE
ECU_9	AUTR2_THROTPOS	THROTTLE POSITION
ECU_10	AUTR2_INJECT_TIME	INJECTION TIME
ECU_11	AUTR2_IGNIT_ANG	IGNITION ADVANCE ANGLE
ECU_12	AUTR2_AF_RATIO	AIR/FUEL RATIO
ECU_13	AUTR2_BATT_VOLT	BATTERY VOLTAGE
ECU_14	AUTR2_TEMP_NTC1	CUSTOM TEMPERATURE #1
ECU_15	AUTR2_TEMP_NTC2	CUSTOM TEMPERATURE #2
ECU_16	AUTR2_TEMP_NTC3	CUSTOM TEMPERATURE #3
ECU_17	AUTR2_TEMP_NTC4	CUSTOM TEMPERATURE #4

"AUTRONIC – SM4"

- ### Serial Communication Set-Up

The ECU has a serial communication protocol (RS 232) and is equipped with a 42 pins connector and two jack input on its right, as shown in the figure below.

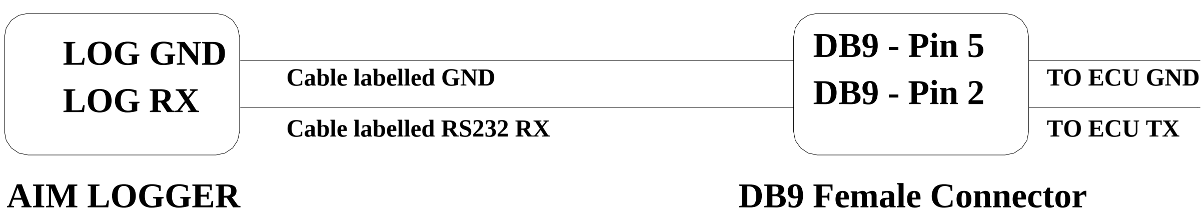


In the ECU package you find also a spiral cable, called "Pc Serial data link connector 3 way 3.5 dia" with a jack connector on one side, to insert in the right bottom jack input (drawn in red colour in the previous figure) and a DB9 female connector on the other side. To correctly connect your ECU to your AIM logger you have to connect your logger to the DB9 female connector.
Here below you see the "PC Serial data link" spiral cable.



- **Connection With AIM Data logger**

To connect Your AIM logger to the ECU, please connect AIM cable labelled as "**RS232RX**" with **pin 2** of the **DB9 female** connector (**that goes to ECU TX**), AIM cable labelled "**GND**" with **pin 5** of the **DB9 female** connector (**that goes to ECU GND**) as in the draw below.



Pin	Function	Comments
5	GND	
2	RS232TX	

AUTRONIC – SM4

ECU_1	SM4_RPM	RPM
ECU_2	SM4_SPEED	VEHICLE SPEED
ECU_3	SM4_DRVWHEEL_SPD	WHEEL SPEED
ECU_4	SM4_WATER_TEMP	WATER TEMPERATURE
ECU_5	SM4_CHARGE_TEMP	AIR/FUEL MIX TEMPERATURE
ECU_6	SM4_INTAKEAIR_TEMP	INTAKE AIR TEMPERATURE
ECU_7	SM4_EXHAUST_PRESS	EXHAUST PRESSURE
ECU_8	SM4_MANIF_PRESS	MANIFOLD PRESSURE

ECU_9	SM4_THROTPOS	THROTTLE POSITION
ECU_10	SM4_CAM_1	CAM ADVANCE ANGLE
ECU_11	SM4_CAM_2	CAM ADVANCE ANGLE
ECU_12	SM4_AF_RATIO	AIR/FUEL RATIO
ECU_13	SM4_BATT_VOLT	BATTERY VOLTAGE
ECU_14	SM4_ERR_C1	ERROR SIGNAL #1
ECU_15	SM4_ERR_C2	ERROR SIGNAL #2
ECU_16	SM4_ERR_C3	ERROR SIGNAL #3
ECU_17	SM4_ERR_C4	ERROR SIGNAL #4
ECU_18	SM4_ERR_C5	ERROR SIGNAL #5
ECU_19	SM4_ERR_C6	ERROR SIGNAL #6
ECU_20	SM4_ERR_C7	ERROR SIGNAL #7
ECU_21	SM4_ERR_C8	ERROR SIGNAL #8
ECU_22	SM4_INJECT_TIME	INJECTION TIME
ECU_23	SM4_IGNI_ANG	IGNITION ADVANCE ANGLE
ECU_24	SM4_KNOC_RET	KNOCK DELAY ANGLE

"BMW – MINI"

BMW - MINI

ECU_1	RPM	RPM
ECU_2	SPEED_BMW	VEHICLE SPEED
ECU_3	PEDAL_POSITION	THROTTLE POSITION
ECU_4	BREAK_SWITCH	BRAKE SWITCH ON/OFF
ECU_5	BREAK_PRESSURE	BRAKE PRESSURE
ECU_6	CLUTCH_SWITCH	CLUTCH SWITCH ON/OFF
ECU_7	STEER_ANGLE	STEERING ANGLE
ECU_8	WATER_TEMP	WATER TEMPERATURE
ECU_9	ENGINE_OIL_TEMP	OIL TEMPERATURE
ECU_10	GEAR_BOX_OIL_TEMP	GEARBOX OIL TEMPERATURE
ECU_11	TEMP_OUTSIDE	INTAKE AIR TEMPERATURE
ECU_12	FUEL	FUEL LEVEL
ECU_13	RPM_TURBO	BOOSTER RPM
ECU_14	ENGINE_MOMENT	TORQUE VALUE (%)
ECU_15	TORQUE	TORQUE VALUE
ECU_16	ELECTROVALVE_STATE	ELECTROVALVE STATE
ECU_17	FULL_LOAD_ALTERNATOR	ALTERNATOR LOAD
ECU_18	WHEEL_SPEED_FRONT_LEFT	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_19	WHEEL_SPEED_FRONT_RIGHT	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_20	WHEEL_SPEED_REAR_LEFT	VEHICLE SPEED – REAR LEFT WHEEL
ECU_21	WHEEL_SPEED_REAR_RIGHT	VEHICLE SPEED – REAR RIGHT WHEEL

"BMW – PT6"

BMW - PT6

ECU_1	RPM	RPM
ECU_2	PEDAL_POSITION	THROTTLE PEDAL POSITION
ECU_3	SPEED_BMW	VEHICLE SPEED
ECU_4	SPEED2_BMW	VEHICLE SPEED#2

ECU_5	WHEEL_SPEED_FRONT_LEFT	SPEED – FRONT LEFT WHEEL
ECU_6	WHEEL_SPEED_FRONT_RIGHT	SPEED – FRONT RIGHT WHEEL
ECU_7	WHEEL_SPEED_REAR_LEFT	SPEED – REAR LEFT WHEEL
ECU_8	WHEEL_SPEED_REAR_RIGHT	SPEED – REAR RIGHT WHEEL
ECU_9	STEER_ANGLE	STEERING ANGLE
ECU_10	CLUTCH_SWITCH	CLUTCH SWITCH ON/OFF
ECU_11	BREAK_SWITCH	BRAKE SWITCH ON/OFF
ECU_12	BREAK_PRESSURE	BRAKE PRESSURE
ECU_13	BREAK_PRESSURE_FRONT_LEFT	B.PRESSURE FRONT LEFT WHEEL
ECU_14	BREAK_PRESSURE_FRONT_RIGHT	B.PRESSURE FRONT RIGHT WHEEL
ECU_15	BREAK_PRESSURE_REAR_LEFT	B.PRESSURE REAR LEFT WHEEL
ECU_16	BREAK_PRESSURE_REAR_RIGHT	B.PRESSURE REAR RIGHT WHEEL
ECU_17	WATER_TEMP	WATER TEMPERATURE
ECU_18	OIL_TEMP	OIL TEMPERATURE
ECU_19	TEMP_OUTSIDE	INTAKE AIR TEMPERATURE
ECU_20	MAP	MANIFOLD PRESSURE
ECU_21	GEAR	ENGAGED GEAR

"BMW – Z4M COUPE'"

BMW - Z4MCOUPE

ECU_1	BMW_RPM	RPM
ECU_2	BMW_IGN_ANG	IGNITION ADVANCE ANGLE
ECU_3	BMW_TPS	THROTTLE POSITION
ECU_4	BMW_GEAR_LEVER	GEAR LEVER POSITION
ECU_5	BMW_VANOS	VARIABLE VALVE TIMING
ECU_6	BMW_TPS_KORR_DSC	
ECU_7	BMW_EGAS_POS	
ECU_8	BMW_ECU_STATE	
ECU_9	BMW_AZ_KORR_DSC	
ECU_10	BMW_AIR_PRESS_DYN	
ECU_11	BMW_OIL_TEMP	OIL TEMPERATURE
ECU_12	BMW_WATER_TEMP	WATER TEMPERATURE
ECU_13	BMW_FUEL_TEMP	FUEL TEMPERATURE
ECU_14	BMW_AIR_TEMP	INTAKE AIR TEMPERATURE
ECU_15	BMW_DIFF_TEMP	DIFFERENTIAL TEMPERATURE
ECU_16	BMW_GEAR_TEMP	GEAR BOX OIL TEMPERATURE
ECU_17	BMW_ECU_TEMP	ECU TEMPERATURE
ECU_18	BMW_CURRENT	
ECU_19	BMW_PSLIM_STATE	
ECU_20	BMW_GEAR	ENGAGED GEAR
ECU_21	BMW_FUEL_LEVEL	FUEL LEVEL
ECU_22	BMW_SW_STATE	
ECU_23	BMW_FUEL_PRESS	FUEL PRESSURE
ECU_24	BMW_WATER_PRESS	WATER PRESSURE
ECU_25	BMW_OIL_PRESS	OIL PRESSURE
ECU_26	BMW_VBATT	BATTERY VOLTAGE
ECU_27	BMW_BRK_PFL	BRAKE PRESSURE FRONT LEFT W.
ECU_28	BMW_BRK_PFR	BRAKE PRESSURE FRONT RIGHT W.
ECU_29	BMW_BRK_PRL	BRAKE PRESSURE REAR LEFT W.
ECU_30	BMW_BRK_PRR	BRAKE PRESSURE REAR RIGHT W.

ECU_31	BMW_P400_N	*** NO INFO AVAILABLE YET***
ECU_32	BMW_P400_C	*** NO INFO AVAILABLE YET***
ECU_33	BMW_P_400T	*** NO INFO AVAILABLE YET***
ECU_34	BMW_SPEED_FL	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_35	BMW_SPEED_FR	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_36	BMW_SPEED_RL	VEHICLE SPEED – REAR LEFT WHEEL
ECU_37	BMW_SPEED_RR	VEHICLE SPEED – REAR RIGHT WHEEL
ECU_38	BMW_LMBD1	LAMBDA VALUE#1
ECU_39	BMW_LMBD2	LAMBDA VALUE#2

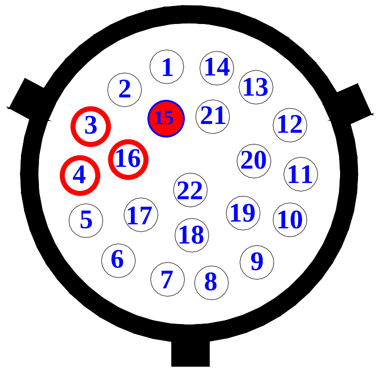
“**BOSCH – AUDI**”

BOSCH – AUDI

ECU_1	AUDI_RPM	RPM
ECU_2	AUDI_SPEED1	VEHICLE SPEED#1
ECU_3	AUDI_WATERTEMP	WATER TEMPERATURE
ECU_4	AUDI_ENGINEMOMENT	TORQUE
ECU_5	AUDI_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_6	AUDI_GASPERC	***NO INFO AVAILABLE YET***
ECU_7	AUDI_BRAKEPRESS	BRAKE PRESSURE
ECU_8	AUDI_SPEED2	VEHICLE SPEED#2
ECU_9	AUDI_SPEEDDASH	DASHBOARD SPEED
ECU_10	AUDI_ACCLAT	LATERAL ACCELERATION
ECU_11	AUDI_STEERMOMENT	STEERING COLUMN MOMENT
ECU_12	AUDI_ATMTEMP	BAROMETRIC TEMPERATURE
ECU_13	AUDI_OILTEMP	OIL TEMPERATURE
ECU_14	AUDI_FRLF_SPEED	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_15	AUDI_FRRG_SPEED	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_16	AUDI_RRLF_SPEED	VEHICLE SPEED – REAR LEFT WHEEL
ECU_17	AUDI_RRRG_SPEED	VEHICLE SPEED – REAR RIGHT WHEEL
ECU_18	AUDI_YAWRATE	YAWRATE
ECU_19	AUDI_STEERSPEED	STEERING ANGULAR RATE
ECU_20	AUDI_STEERANGLE	STEERING ANGLE
ECU_21	AUDI_BRAKE	BRAKE SWITCH ON/OFF
ECU_22	AUDI_FUEL	FUEL LEVEL
ECU_23	AUDI_GEAR	ENGAGED GEAR
ECU_24	AUDI_ENGOILT	ENGINE OIL TEMPERATURE
ECU_25	AUDI_TPS	THROTTLE POSITION
ECU_26	AUDI_CLUTCH	CLUTCH POSITION
ECU_27	AUDI_BOOST_PRESS	BOOST PRESSURE
ECU_28	AUDI_ENGINE_MOMENT	TORQUE VALUE
ECU_29	AUDI_SHIFTING_ACTIVE	***
ECU_30	AUDI_TIP_TRONIK_DW	TIPTRONIK GEAR DOWN
ECU_31	AUDI_TIP_TRONIK_UP	TIPTRONIK GEAR UP
ECU_32	AUDI_SIN_NAM	
ECU_33	AUDI_SIN_NEW1	
ECU_34	AUDI_SIN_NEW2	
ECU_35	AUDI_SIN_NAB	
ECU_36	AUDI_SIP_PK1	
ECU_37	AUDI_SIP_PK2	

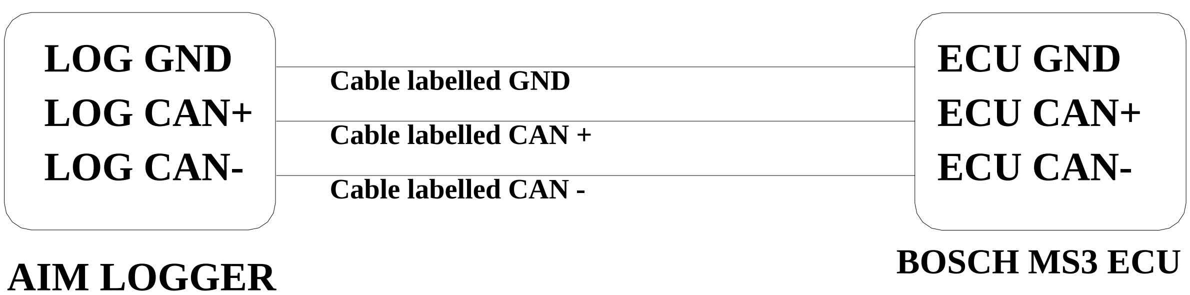
"BOSCH – MS3"

This ECU can be installed on Porsche 911 GT3 Cup cars.
On Porsche 911 GT3 Cup cars that have this ECU you find a 22 pins Deutsch connector with red threading (Part Number RP 3759339), shown below.



- **Connection With AIM Data logger**

To connect Your AIM logger to the ECU, please connect cable labelled **CAN +** with **pin 4** of the ECU, cable labelled **CAN –** with **pin 16** of the ECU and cable labelled **GND** with **pin 3** of the ECU as shown in the figure below:



Pin	Function	Comments
4	CAN +	
16	CAN -	
3	GND	

Please note: if you want to **power** your **AIM logger** directly from the ECU, you can use **pin 15 of the ECU** (+12V), highlighted with a red coloured circle in the figure below.

BOSCH – MS3

ECU_1	BOSCH_RPM	RPM
ECU_2	BOSCH_SPEED1	SPEED#1
ECU_3	BOSCH_SPEED2	SPEED#2
ECU_4	BOSCH_OIL_PRESS	OIL PRESSURE
ECU_5	BOSCH_FUEL_PRESS	FUEL PRESSURE
ECU_6	BOSCH_ATM_PRESS	BAROMETRIC PRESSURE
ECU_7	BOSCH_FUEL_TEMP	FUEL TEMPERATURE
ECU_8	BOSCH_OIL_TEMP	OIL TEMPERATURE
ECU_9	BOSCH_ENGINE_TEMP	ENGINE TEMPERATURE
ECU_10	BOSCH_AIR_TEMP	INTAKE AIR TEMPERATURE
ECU_11	BOSCH_THROTT_ANG	THROTTLE POSITION
ECU_12	BOSCH_IGNIT_ANG	IGNITION ADVANCE ANGLE
ECU_13	BOSCH_AIR_CHARGE	AIR/FUEL MIX
ECU_14	BOSCH_INJEC_TIME1	INJECTION TIME#1
ECU_15	BOSCH_INJEC_TIME2	INJECTION TIME#2
ECU_16	BOSCH_LAMBDA1	LAMBDA VALUE#1
ECU_17	BOSCH_LAMBDA2	LAMBDA VALUE#2
ECU_18	BOSCH_LAM_CONTR1	LAMBDA CONTROLLER OUTPUT#1
ECU_19	BOSCH_LAM_CONTR2	LAMBDA CONTROLLER OUTPUT#2
ECU_20	BOSCH_FUEL_USED	FUEL USED
ECU_21	***NOT AVAILABLE***	
ECU_22	BOSCH_GEAR	ENGAGED GEAR
ECU_23	BOSCH_VBATT	BATTERY VOLTAGE

"BOSCH – MS4"

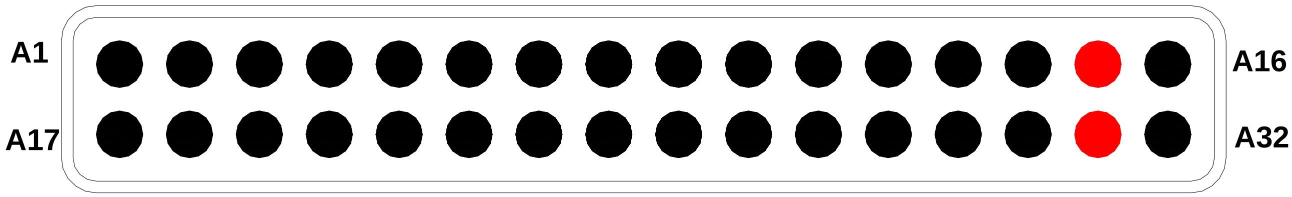
BOSCH – MS4

ECU_1	BOSCH_RPM	RPM
ECU_2	BOSCH_VEHICLE_SPEED	VEHICLE SPEED
ECU_3	BOSCH_TPS	THROTTLE POSITION
ECU_4	BOSCH_IGNIT_ANG	IGNITION ADVANCE ANGLE
ECU_5	BOSCH_ENGINE_TEMP	ENGINE TEMPERATURE
ECU_6	BOSCH_OIL_TEMP	OIL TEMPERATURE
ECU_7	BOSCH_FUEL_TEMP	FUEL TEMPERATURE
ECU_8	BOSCH_AIR_TEMP	INTAKE AIR TEMPERATURE
ECU_9	BOSCH_GEAR	ENGAGED GEAR
ECU_10	BOSCH_GEAR_OIL_P	GEARBOX OIL PRESSURE
ECU_11	BOSCH_FUEL_PRESS	FUEL PRESSURE
ECU_12	BOSCH_WATER_PRESS	WATER PRESSURE
ECU_13	BOSCH_ATM_PRESS	BAROMETRIC PRESSURE
ECU_14	BOSCH_OIL_PRESS	OIL PRESSURE
ECU_15	BOSCH_LAMBDA1	LAMBDA VALUE#1
ECU_16	BOSCH_LAMBDA2	LAMBDA VALUE#2
ECU_17	BOSCH_AFR1	AIR/FUEL RATIO#1
ECU_18	BOSCH_AFR2	AIR/FUEL RATIO#2
ECU_19	BOSCH_INJEC_TIME1	INJECTION TIME#1
ECU_20	BOSCH_INJEC_TIME2	INJECTION TIME#2
ECU_21	BOSCH_FUEL_USED	FUEL USED
ECU_22	BOSCH_ACC_X	ACCELERATION – AXLE X

ECU_23	BOSCH_ACC_Y	ACCELERATION – AXLE Y
ECU_24	BOSCH_ACC_Z	ACCELERATION – AXLE Z
ECU_25	BOSCH_BREAK_P_R	BRAKE PRESSURE REAR
ECU_26	BOSCH_BREAK_P_F	BRAKE PRESSURE FRONT
ECU_27	BOSCH_EXAUST_GAS	EXHAUST TEMPERATURE
ECU_28	BOSCH_SPEED_F_L	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_29	BOSCH_SPEED_F_R	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_30	BOSCH_SPEED_R_L	VEHICLE SPEED – REAR LEFT WHEEL
ECU_31	BOSCH_SPEED_R_R	VEHICLE SPEED – REAR RIGHT WHEEL

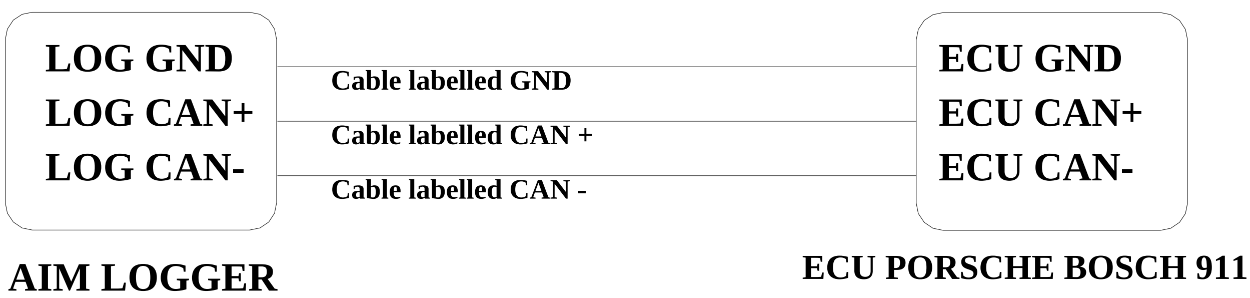
“BOSCH - PORSCHE 911 (Mod. 996)”

The ECU we call Bosch Porsche 911 is an ECU made by Bosch manufacturer and generally installed on Porsche 911 cars (996 model). This ECU has a CAN Protocol and is equipped with a 32 Pins green connector called “A” and used to communicate with an external data logger as well as to configure the ECU itself. Bosch Porsche 911 connector is shown below.



- **Connection With AIM Data logger**

To connect Your AIM logger to the ECU, please connect cable labelled **CAN +** with **pin A15** of the ECU (**CAN HIGH**), cable labelled **CAN –** with **pin 31** of the ECU (**CAN LOW**) and cable labelled **GND** with pin **GND** of the ECU, as shown in the figure below:



Pin	Function	Comments
A15	CAN +	
A31	CAN -	

Please note: as far as GND is concerned, please use the same GND you use for the ECU

BOSCH – PORSCHE_911(996)

ECU_1	P911_RPM	RPM
ECU_2	P911_SPEED1	VEHICLE SPEED
ECU_3	P911_PPS	THROTTLE PEDAL POSITION
ECU_4	P911_ENGINEMOMENT	TORQUE VALUE
ECU_5	P911_WATERTEMP	WATER TEMPERATURE
ECU_6	P911_AIRTEMP	INTAKE AIR POSITION
ECU_7	P911_BRAKE	BRAKE SENSOR ON/OFF

"BOSCH - PORSCHE 911 (Mod. 997)"

BOSCH – PORSCHE_911(997)

ECU_1	P997_RPM	RPM
ECU_2	P997_SPEEDFL	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_3	P997_SPEEDFR	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_4	P997_SPEEDRL	VEHICLE SPEED – REAR LEFT WHEEL
ECU_5	P997_SPEEDRR	VEHICLE SPEED – REAR RIGHT WHEEL
ECU_6	P997_PPS	THROTTLE PEDAL POSITION
ECU_7	P997_ENGINE_TEMP	ENGINE TEMPERATURE
ECU_8	P997_STEER_ANGLE	STEERING ANGLE
ECU_9	P997_FREE	CUSTOM CHANNEL
ECU_10	P997_FREE	CUSTOM CHANNEL
ECU_11	P997_FREE	CUSTOM CHANNEL
ECU_12	P997_FREE	CUSTOM CHANNEL

"BOSCH – SEAT LEON CUP"

BOSCH – SEAT_LEON_CUP

ECU_1	RPM	RPM
ECU_2	FOOT_THROTTLE	THROTTLE PEDAL POSITION
ECU_3	THROTTLE	THROTTLE BODY POSITION
ECU_4	SPEED_FL	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_5	SPEED_FR	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_6	SPEED_RL	VEHICLE SPEED – REAR LEFT WHEEL
ECU_7	SPEED_RR	VEHICLE SPEED – REAR RIGHT WHEEL
ECU_8	WATER_TEMP	WATER TEMPERATURE
ECU_9	AIR_TEMP	INTAKE AIR TEMPERATURE
ECU_10	TURBO_PRESS	TURBO PRESSURE
ECU_11	TURBO_PRESS_HF	TURBO PRESSURE (HIGH THRESHOLD)
ECU_12	TURBO_PRESS_LF	TURBO PRESSURE (LOW THRESHOLD)
ECU_13	BOOST_PRESS	BOOSTER PRESSURE
ECU_14	FUEL_PRESS_L	FUEL PRESSURE (LOW THRESHOLD)
ECU_15	FUEL_PRESS_H	FUEL PRESSURE (HIGH THRESHOLD)
ECU_16	LAMBDA	LAMBDA VALUE
ECU_17	AIRFLOW	INTAKE AIR PRESSURE
ECU_18	GEAR	ENGAGED GEAR
ECU_19	GEAR_LEVER_POS	GEAR LEVER POSITION
ECU_20	GEAR_LEVER_POS2	GEAR LEVER POSITION
ECU_21	FAILURE	ERROR SIGNAL

"BOSCH – VW GROUP"

BOSCH – VW GROUP

ECU_1	BOSCH-VW_RPM	RPM
ECU_2	BOSCH-VW_SPEED1	VEHICLE SPEED
ECU_3	BOSCH-VW_WATERTEMP	WATER TEMPERATURE
ECU_4	BOSCH-VW_ENGINEMOMENT	TORQUE VALUE
ECU_5	BOSCH-VW_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_6	BOSCH-VW_GASPERC	***NO INFO AVAILABLE YET***
ECU_7	BOSCH-VW_BRAKEPRESS	BRAKE PRESSURE
ECU_8	BOSCH-VW_SPEED2	VEHICLE SPEED#2
ECU_9	BOSCH-VW_SPEEDDASH	DASHBOARD SPEED
ECU_10	BOSCH-VW_ACCLAT	LATERAL ACCELERATION
ECU_11	BOSCH-VW_STEERMOMENT	STEERING COLUMN MOMENT
ECU_12	BOSCH-VW_ATMTEMP	BAROMETRIC TEMPERATURE
ECU_13	BOSCH-VW_OILTEMP	OIL TEMPERATURE
ECU_14	BOSCH-VW_FRLF_SPEED	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_15	BOSCH-VW_FRRG_SPEED	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_16	BOSCH-VW_RRLF_SPEED	VEHICLE SPEED – REAR LEFT WHEEL
ECU_17	BOSCH-VW_RRRG_SPEED	VEHICLE SPEED – REAR RIGHT WHEEL
ECU_18	BOSCH-VW_YAWRATE	YAWRATE
ECU_19	BOSCH-VW_STEERSPEED	STEERING ANGULAR RATE
ECU_20	BOSCH-VW_STEERANGLE	STEERING ANGLE

ECU_21	BOSCH-VW_BRAKE	BRAKE SWITCH ON/OFF
ECU_22	BOSCH-VW_FUEL	FUEL LEVEL
ECU_23	BOSCH-VW_GEAR	ENGAGED GEAR
ECU_24	BOSCH-VW_ENGOILT	ENGINE OIL TEMPERATURE
ECU_25	BOSCH-VW_TPS	THROTTLE POSITION
ECU_26	BOSCH-VW_CLUTCH	CLUTCH POSITION

"CARMO - AFI 2003"

AIM loggers can be connected to both Carmo ignition or injection unit (AFI 2003); they can acquire data from Carmo units installed on Honda CBR600, Kawasaki ZX6R, Yamaha YZ6F and Suzuki GSXR600.
The configuration procedure is the same for every bike; when you have selected the channels to acquire or to display, the logger will be able to automatically select the right set of sensors, using the information given by AFI unit.

PLEASE NOTE: every manufacturer has it's own set of sensors; if the set of sensors is not the one usually used by the manufacturer for that type of bike, the acquired data could be wrong.

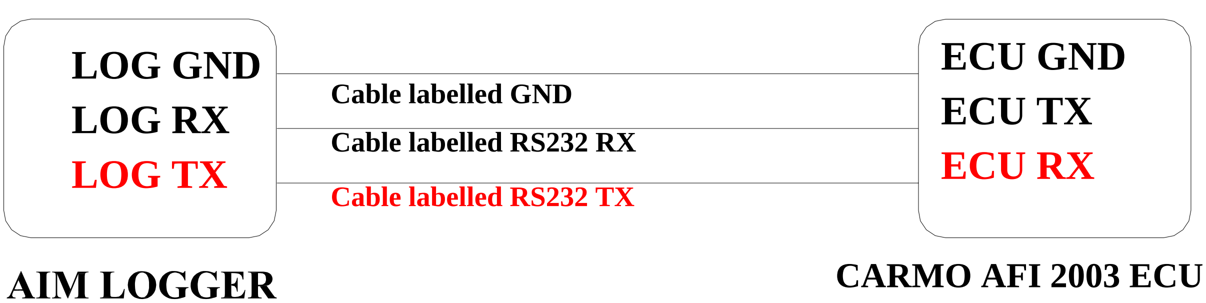
Injection unit
All ECU channels listed in the configuration dialog window are available when the logger is connected to the injection unit.

Ignition unit
Only RPM and Throttle Position channels are available when the logger is connected to the ignition unit. In this case we recommend to disable the other ECU channels in order to save memory.

- ## Connection With AIM Data logger

Connect cable labelled **RS 232 RX** with **ECU TX** pin, cable called **RS 232 TX** with **ECU RX** pin and cable called **GND** with **ECU Power GND** pin as shown in the figure below.

Please refer to Your ECU user manual to know Your ECU pinout.



Please note: this ECU needs connection of **LOG TX** cable to **ECU RX** pin too.

CARMO – AFI_2003

ECU_1	CARMO_RPM	RPM
ECU_2	CARMO_THROTTLE	THROTTLE POSITION
ECU_3	CARMO_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_4	CARMO_WATERTEMP	WATER TEMPERATURE
ECU_5	CARMO_MANIFPRES	MANIFOLD PRESSURE
ECU_6	CARMO_BATTERY	BATTERY VOLTAGE

"CARMO - AFI 2005"

AIM loggers can be connected to both Carmo ignition or injection unit (AFI 2005); they can acquire data from Carmo units installed on Honda CBR600, Kawasaki ZX6R, Yamaha YZ6F and Suzuki GSXR600.
The configuration procedure is the same for every bike; when you have selected the channels to acquire or to display, the logger will be able to automatically select the right set of sensors, using the information given by the AFI unit.

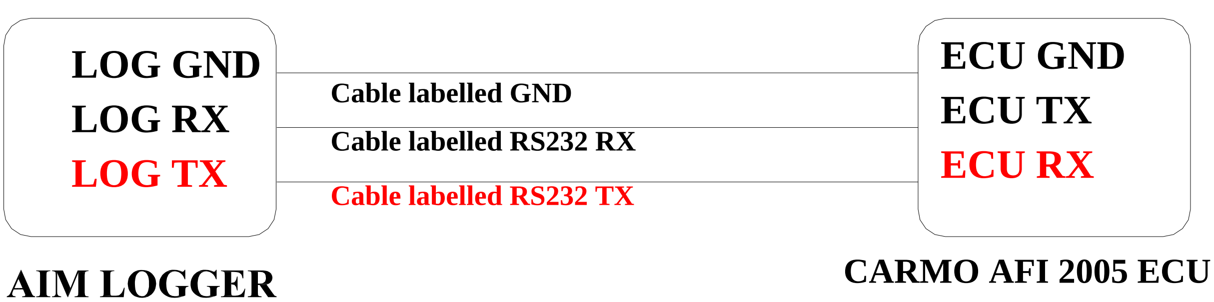
PLEASE NOTE: every manufacturer has it's own set of sensors; if the set of sensors is not the one usually used by the manufacturer for that type of motorbike, the acquired data could be wrong.

Injection unit
All the ECU channels listed in the configuration dialog window are available when the logger is connected to the injection unit.

Ignition unit
Only RPM and Throttle Position channels are available when the logger is connected to the ignition unit. In this case we recommend to disable the other ECU channels in order to save memory.

- ### Connection With AIM Data logger

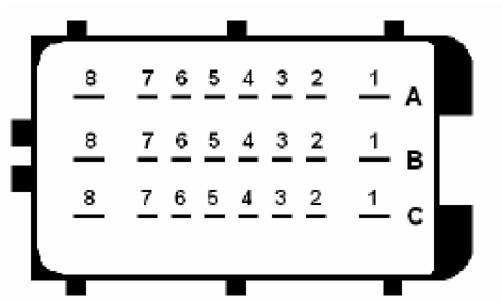
Your Carmo AFI 2005 ECU has two coloured connectors mounted on the backside, a grey one and a black one. To connect your ECU with AIM loggers you need to connect cable called **RS 232 RX** with **ECU TX** (**pin A4 of the ECU grey connector**), cable called **RS 232 TX** with **ECU RX** (**pin A5 of the ECU grey connector**) and cable called **GND** with the **ECU GND** (**pin A6 of the ECU grey connector**) as shown in the figure below.



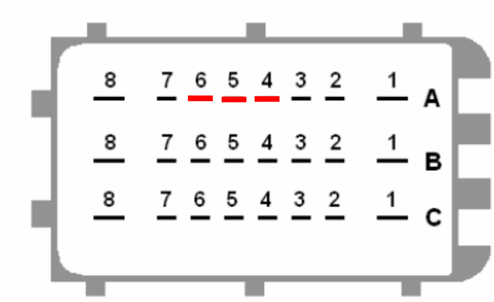
Please note: this ECU needs connection of **LOG TX** cable to **ECU RX** pin too.

Pin	Function	Comments
A6	GND	
A5	RS232RX	
A4	RS232TX	

Here below are shown AFI 2005 connectors and their pinout.



AFI 2005 Black Connector



AFI 2005 Grey connector

Pin	FUNCTION
A8	Ignitioncoil #3
A7	Ignitioncoil #2
A6	Ignitioncoil #1
A5	Injector #1
A4	Shower injector #1
A3	Injector #2
A2	Shower injector #2
A1	Injector #3
B8	Ignitioncoil #4
B7	EXUP (-) not connected
B6	EXUP (+) not connected
B5	Ground EXUP-position-not connected
B4	Signal EXUP-position–not connected
B3	VCC EXUP-position-not connected
B2	-
B1	Injector #4
C8	Power Ground
C7	Power Ground
C6	-
C5	-
C4	Shift-light output
C3	Fan output
C2	Shower injector #4
C1	Shower injector #3

Pin	AIM Logger	Function
A8		Ground
A7		Down sensor
A6	**LOG GND**	**ECU Ground**
A5	**LOG TX**	**ECU RX**
A4	**LOG RX**	**ECU TX**
A3		ECT sensor
A2		IAT sensor
A1		MAP sensor
B8		Ground
B7		Launch control output
B6		Quick-shift input
B5		Ground TX RX (2)
B4		TX (2)
B3		2nd map input
B2		TPS sensor
B1		+12V
C8		Ground
C7		+5V sensors
C6		Tacho output
C5		Ground
C4		RX (2)
C3		Cam signal
C2		Crank signal
C1		Fuelpump relais output

CARMO – AFI_2005

ECU_1	CARMO_RPM	RPM
ECU_2	CARMO_THROTTLE	THROTTLE POSITION
ECU_3	CARMO_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_4	CARMO_WATERTEMP	WATER TEMPERATURE
ECU_5	CARMO_MANIFPRES	MANIFOLD PRESSURE
ECU_6	CARMO_BATTERY	BATTERY VOLTAGE

"DALLARA – VW_16_FSI"

DELPHI – MEFI-4B

ECU_1	DALLARA_RPM	RPM
ECU_2	DALLARA_ECT	WATER TEMPERATURE
ECU_3	DALLARA_TPS	THROTTLE POSITION
ECU_4	DALLARA_OIL_TEMP	OIL TEMPERATURE

"DELPHI – MEFI 4B"

DELPHI – MEFI-4B

ECU_1	MEFI-4B_RPM	RPM
ECU_2	MEFI-4B_ECT	WATER TEMPERATURE
ECU_3	MEFI-4B_EIV	VOLTAGE
ECU_4	MEFI-4B_EOP	OIL PRESSURE
ECU_5	MEFI-4B_SPEED	VEHICLE SPEED
ECU_6	MEFI-4B_FUELCONS	FUEL CONSUMED
ECU_7	MEFI-4B_STATUS	STATUS VALUE
ECU_8	MEFI-4B_FUELPRESS	FUEL PRESSURE
ECU_9	MEFI-4B_EGRFB	***
ECU_10	MEFI-4B_FTEMP	FUEL TEMPERATURE
ECU_11	MEFI-4B_MAT	MANIFOLD TEMPERATURE
ECU_12	MEFI-4B_RUNTIME_HOUR	RUNNING TIMER (HOUR)
ECU_13	MEFI-4B_RUNTIME_MIN	RUNNING TIMER (MIN)
ECU_14	MEFI-4B_RPM2	RPM#2
ECU_15	MEFI-4B_MAP_VOLTS	MANIFOLD PRESSURE (VOLTS)
ECU_16	MEFI-4B_MAP	MANIFOLD PRESSURE

"DTA - P8"

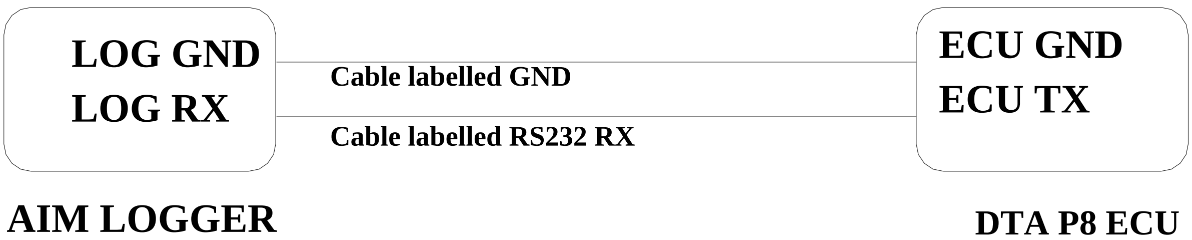
- **Serial Communication Set-Up**

The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.

- **Connection With AIM Data logger**

To connect Your AIM logger to the ECU, please connect AIM cable labelled as “**RS232RX**” with **ECU TX**, AIM cable labelled as “**GND**” with **ECU GND** as in the draw below.

Please refer to Your ECU user manual to know Your ECU pinout.



DTA – P_8

ECU_1	DTA_RPM	RPM
ECU_2	DTA_WHEELSPD	VEHICLE SPEED
ECU_3	DTA_WATERTEMP	WATER TEMPERATURE
ECU_4	DTA_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	DTA_MANIFPRESS	MANIFOLD PRESSURE
ECU_6	DTA_THROTANG	THROTTLE POSITION
ECU_7	DTA_LAMBDA	LAMBDA VALUE
ECU_8	DTA_BATTV	BATTERY VOLTAGE

“DTA - P8V29/ P8V30”

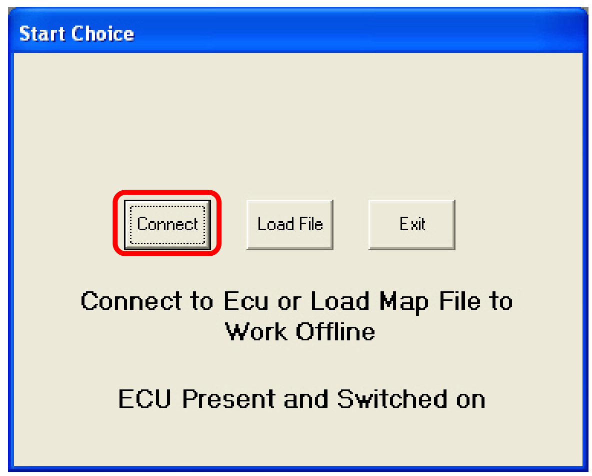
- **Serial Communication Set-Up**

The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.

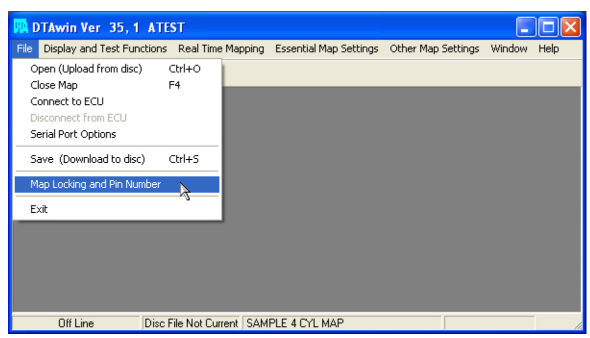
- **DTA Configuration**

In order to make DTA ECU communicate with AIM Logger you need to configure the ECU using DTAWin software. To do so, please follow these steps.

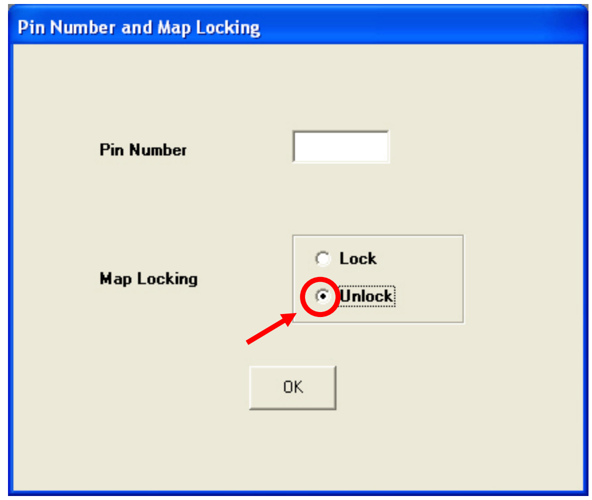
Launch DTAWin software. “Start Choice” window is prompted. Please click on “Connect” button.
If a windows saying “No Matching File on disc Use Save to Make one” appears, please click on “OK” button and then on “Connect” button



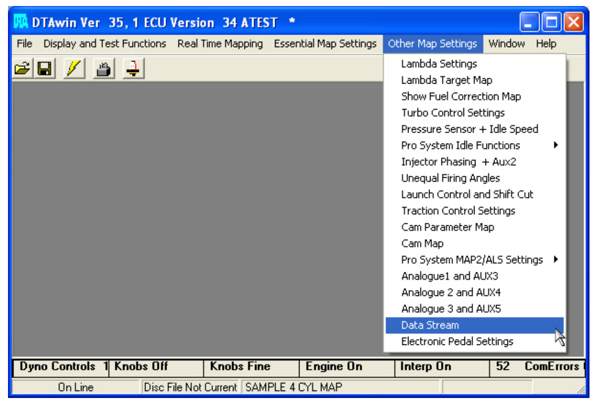
DTAWin main window appears. Please click on “File” button on the top toolbar and select “Map Locking and Pin Number” option.



When "Pin Number and Map Locking" window appears, please enable "Unlock" checkbox and press "OK" button.

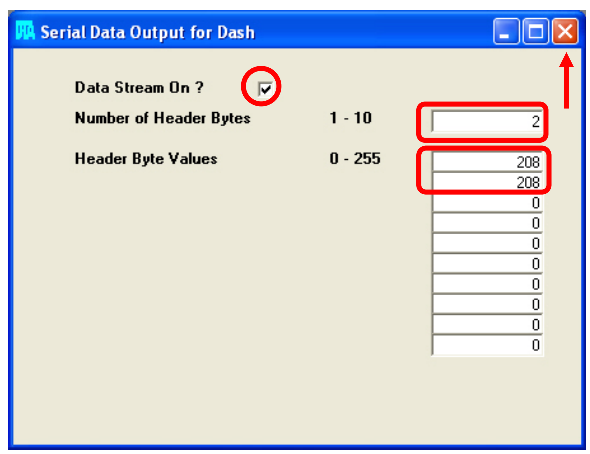


You step back to DTAWin Main window; please click on "Other Map Settings" on the top toolbar and select "Data Stream" option.

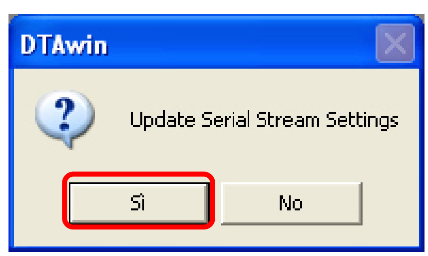


When Serial Data Output for Dash window appears, please set it as follows:

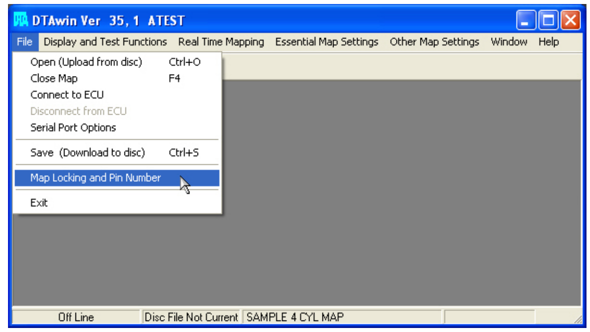
- enable "Data Stream on?" checkbox
- Fill "Number of Header Bytes 1-10" box with number "2"
- Set 208 on the first two rows of Header Bytes Value box
- Close the window clicking on the red cross on the top right corner



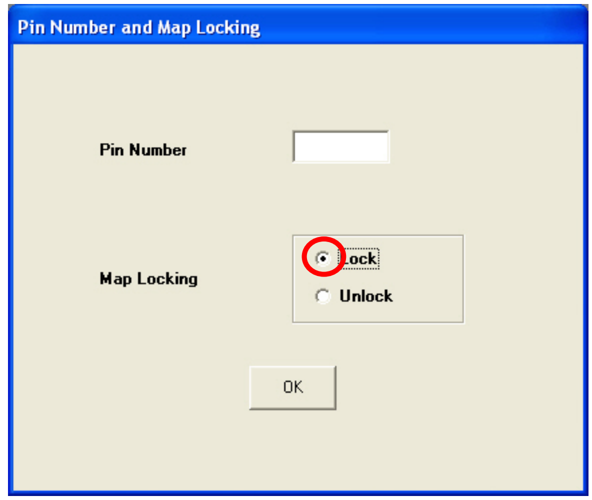
A window asking you if you want to update Serial Stream Settings appears; please click on "Yes" button.



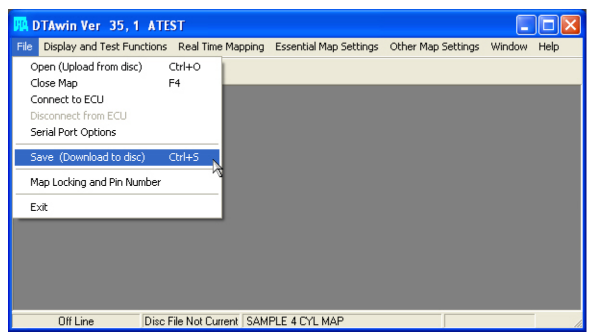
DTAWin main window appears. Please click on “File” button on the top toolbar and select “Map Locking and Pin Number” option.



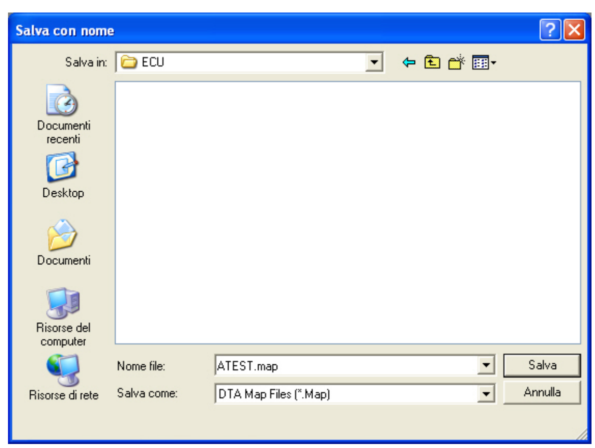
When “Pin Number and Map Locking” window appears, please enable “Lock” checkbox and then press “OK” button.



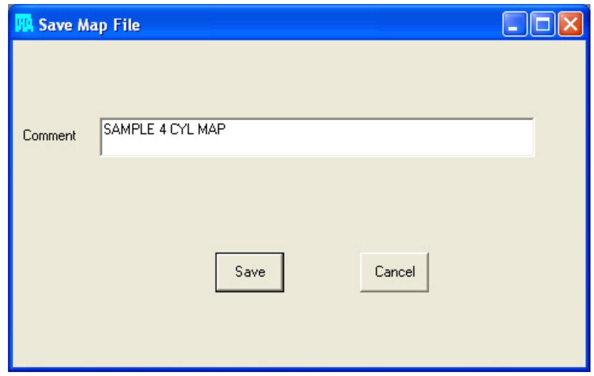
DTAWin main window appears. Please click on “File” button on the top toolbar and select “Save (Download to disc)” option.



“Save as” window appears. Please insert file name and press “Save” button.



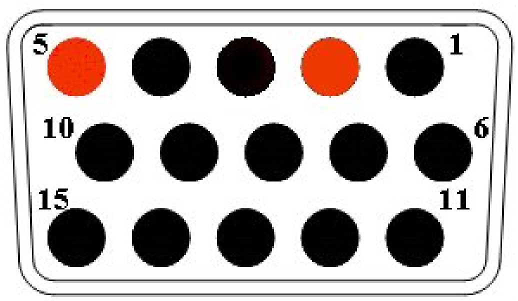
"Save Map file" window appears. Please insert Map comment and click on "Save" button.



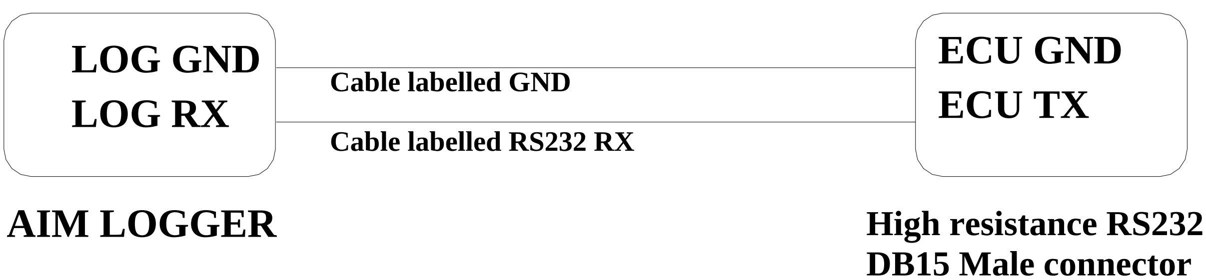
Please note: this configuration has been tested on DTA P8V30 ECU, but we have good reasons to think that this configuration should fit DTAP8 and DTA P8V29 ECU too.

- ## Connection With AIM Data logger

DTA P8V30 ECU has a DB15 female connector; to connect the ECU with AIM loggers you need to have an RS232 DB15 male high resistance connector, shown below.



To connect Your AIM logger to the ECU, please connect AIM cable labelled as "**RS232RX**" with **Pin 2** of the **RS232 DB15 male connector** (goes to ECU TX), AIM cable labelled as "**GND**" with **Pin 5** of the **RS232 DB15 male connector** (goes to ECU GND) as in the draw below.



Pin DB15	Function	Comments
5	GND	
2	RS232TX	

DTA – P_8V29

ECU_1	DTA_RPM	RPM
ECU_2	DTA_THROTANG	THROTTLE POSITION
ECU_3	DTA_WATERTEMP	WATER TEMPERATURE
ECU_4	DTA_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	DTA_MANIFPRESS	MANIFOLD PRESSURE
ECU_6	DTA_LAMBDA	LAMBDA VALUE
ECU_7	DTA_BATTV	BATTERY VOLTAGE
ECU_8	DTA_WHEELSPD	WHEEL SPEED

DTA – P_8V30

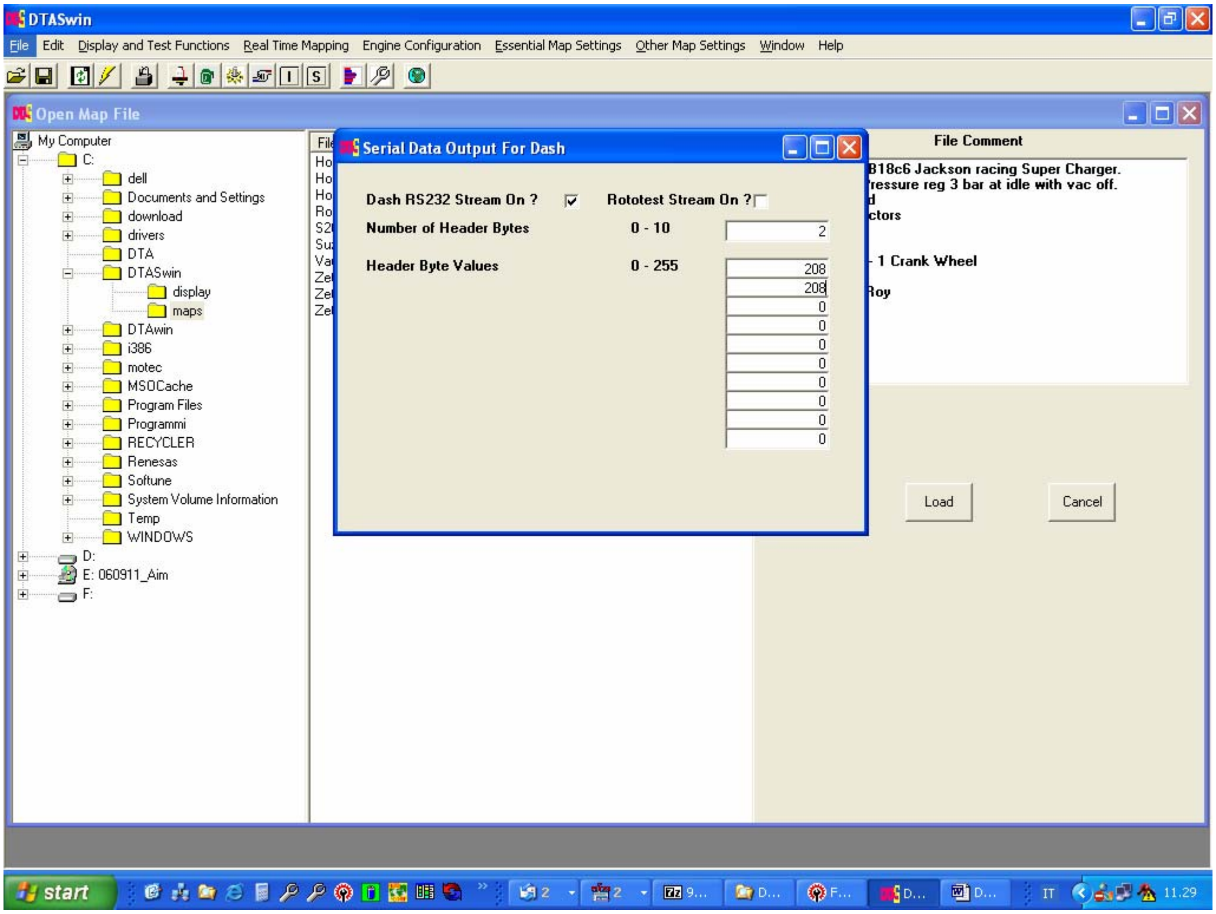
ECU_1	DTA_RPM	RPM
ECU_2	DTA_THROTANG	THROTTLE POSITION
ECU_3	DTA_WATERTEMP	WATER TEMPERATURE
ECU_4	DTA_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	DTA_MANIFPRESS	MANIFOLD PRESSURE
ECU_6	DTA_LAMBDA	LAMBDA VALUE
ECU_7	DTA_BATTV	BATTERY VOLTAGE
ECU_8	DTA_WHEELSPD	WHEEL SPEED
ECU_9	DTA_ANA1	ANALOG CHANNEL #1
ECU_10	DTA_ANA2	ANALOG CHANNEL #2
ECU_11	DTA_ANA3	ANALOG CHANNEL #3

"DTA–S60"

- **Serial Communication Set-Up**

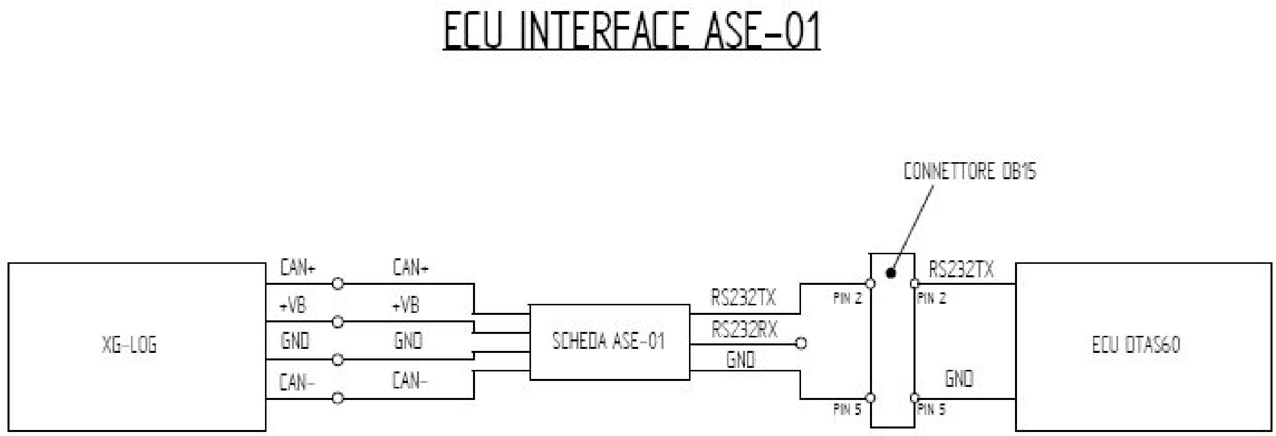
In order to make DTA ECU communicate with AIM Logger you need to configure the ECU using DTASwin software. To do so, please follow these steps, as showed in the picture.

Open the menu - Other Map Setting->DataStream
Flag the checkbox "- Dash RS232 Stream on?"
Insert these values: Number of Header Bytes -> **2**
Header Byte Values -> **208** (in the first and second line)
Save configuration and close the program.



- ### Connection With AIM Data logger

In order to connect the datalogger to the DTA S60 ECU, you need to connect the ASE 01 between the AIM system and the ECU as shown below. Please note that the connection is made by using a DB15 interface that uses the RS232Tx and the GND connectors.



DTA – S60

ECU_1	DTA_RPM	RPM
ECU_2	DTA_THROTANG	THROTTLE POSITION
ECU_3	DTA_WATERTEMP	WATER TEMPERATURE
ECU_4	DTA_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	DTA_MANIFPRESS	MANIFOLD PRESSURE
ECU_6	DTA_LAMBDA	LAMBDA VALUE
ECU_7	DTA_BATTV	BATTERY VOLTAGE
ECU_8	DTA_WHEELSPD	WHEEL SPEED
ECU_9	DTA_OIL_PRESS	OIL PRESSURE
ECU_10	DTA_FUEL_PRESS	FUEL PRESSURE
ECU_11	DTA_OIL_TEMP	OIL TEMPERATURE

"DUCATI ENERGIA – Mod. TERRA MODENA"

DUCATI – ENERGIA

ECU_1	ENERGIA_RPM	RPM
ECU_2	ENERGIA_LAMBDA	LAMBDA VALUE
ECU_3	ENERGIA_THROTPOS	THROTTLE POSITION
ECU_4	ENERGIA_AIR_PRESS	INTAKE AIR PRESSURE
ECU_5	ENERGIA_OIL_PRESS	OIL PRESSURE
ECU_6	ENERGIA_WATER_TEMP	WATER TEMPERATURE
ECU_7	ENERGIA_AIR_TEMP	INTAKE AIR TEMPERATURE
ECU_8	ENERGIA_BATTERY	BATTERY VOLTAGE
ECU_9	ENERGIA_ERROR	ERROR SIGNAL

“EFI EUROPE ECU GENERAL INFORMATION”

• Introduction

EFI ECUs actually supported by all those AIM instruments that can be interfaced with an ECU are:

- EURO 1
- EURO 4
- EURO 6
- EURO 12
- EURO 96

• Technical communication notes

All EFI ECUs have a CAN line to export data to a third party data logger; this CAN line normally works with two only wires

1. CAN hi (corresponding to AIM Can + **white wire**)
2. CAN low (corresponding to AIM Can - **blue wire**)

It is normally unnecessary to ground CAN line with our system.

To have communication between EFI and AIM devices you have to configure his ECU with ECT software; please choose 2D data stream (this is valid for all models) in the proper page. You can normally choose one of the following options:

1. UDA91 (for Magneti Marelli Dashboard)
2. **2D** (for 2D and AIM loggers and dashes)

If getting data from the ECU is not possible first of all, please make an **hardware check**:

1. check if “line-end resistor” is installed: a 120 Ohm resistor should be found between CAN+ and CAN– (this can be done with any multimeter); to do so, please disconnect AIM instrument from the ECU and make this check on both side (ECU and logger);
2. check if amplitude of each “bit” is 2V (or at least 1.8 V); this test can be done with a scope grounding the sond on CAN- wire and measuring on CAN+ ; please ensure that no filtering feature is enabled on the scope (this because of high baud rate of this line)

On a second step, please ensure that your dashboard is firm upped with the latest firm up version and configured with the latest Race Studio 2 release.

Once those conditions are satisfied, if the system continues not getting data from EFI hardware, the problem is in EFI firmware. Please refer to the following table and contact an EFI dealer to have the ECU upgraded.

EFI MODEL	EFI FIRMWARE VERSION	CONNECTIBILITY AIM LOGGERS-EFI FIRMWARE	WHAT TO DO
EURO 1	300	From 380	Nothing to select
EURO 1	400	Always	2d stream selection via software
EURO 96	300	From 310	2d stream selection via software
EURO 96	400	Always	2d stream selection via software
EURO 6 & 12	300	Always	2d stream selection via software
EURO 6 & 12	400	Always	2d stream selection via software
All models	200	Never	ECU Firm up needed; please contact EFI for maps compatibility with the new firmware

"EFI EUROPE – EURO 1"

- **EFI ECU to AIM CAN Configuration**

Please note: EFI Euro 1 ECU communication with AIM loggers depends on ECU firmware version.

Euro 1 – until firmware version 379 included.
It is not possible to communicate; please contact EFI manufacturer to upgrade Your ECU firmware.

Euro 1 – from firmware version 380 until firmware version 400:
In EFI configuration software protocol implemented in your ECU is perfectly compatible with AIM loggers and works.

Euro 1 – from firmware version 400:

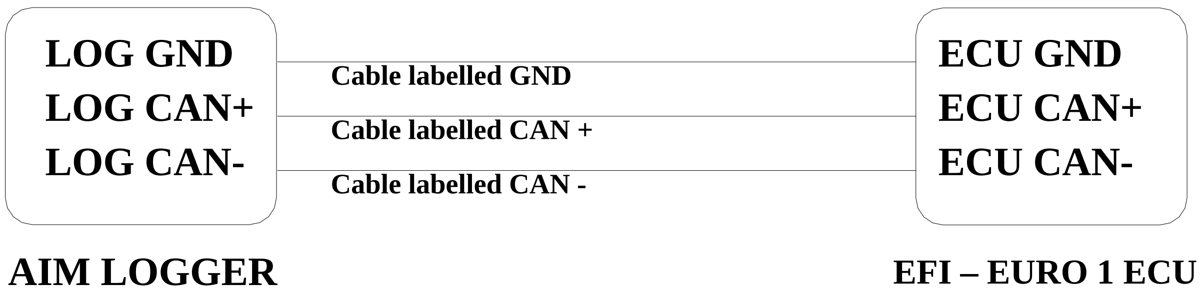
In ECU software, "ECT", you can choose different datasets for CAN protocol management concerning output data:

- UDA 91
- None
- 2D

Please select **2D** protocol

- ### Connection With AIM Data logger

Your ECU is equipped with a 35 pins AMP connector used to communicate parameters to an external data logger or to configure the ECU itself.
To connect your AIM logger to the ECU, please connect cable labelled **CAN +** with pin 22 of the ECU (**CAN +**), cable labelled **CAN -** with pin 6 of the ECU (**CAN -**) and cable labelled **GND** with pin 23 of the ECU as in the figure below:



Pin	Function	Comments
23	GND	
22	CAN +	
6	CAN -	

EFI_EUROPE – EURO_1

ECU_1	EFI_RPM	RPM
ECU_2	EFI_TPS	THROTTLE POSITION
ECU_3	EFI_DFARF	THROTTLE POSITION DERIVATIVE
ECU_4	EFI_MAP	MANIFOLD PRESSURE
ECU_5	EFI_BARO	BAROMETRIC PRESSURE
ECU_6	EFI_ARR_TRANS	ENRICHMENT TPS TRANSITION
ECU_7	EFI_SPEED	VEHICLE SPEED
ECU_8	EFI_VBATT	BATTERY VOLTAGE
ECU_9	***NOT AVAILABLE***	
ECU_10	***NOT AVAILABLE***	
ECU_11	***NOT AVAILABLE***	
ECU_12	***NOT AVAILABLE***	
ECU_13	EFI_TEROGBASE	EROG TIME ON FUEL TAB
ECU_14	EFI_TEROG	REAL EROG TIME
ECU_15	EFI_TEROG12	EROG TIME FOR CYLINDER 1-2
ECU_16	EFI_TEROG34	EROG TIME FOR CYLINDER 3-4
ECU_17	EFI_SABASE	SPARK ADVANCE ON IGNITION TABLE
ECU_18	EFI_SA	REAL SPARK ADVANCE
ECU_19	EFI_SA1	SPARK ADVANCE FOR CYLYNDER 1-2
ECU_20	EFI_SA2	SPARK ADVANCE FOR CYLYNDER 3-4
ECU_21	EFI_NTK1	LAMBDA VALUE #1
ECU_22	EFI_FCCLAT	***NO INFO AVAILABLE YET***

ECU_23	EFI_KFUELLEARN	FUEL CORRECTION COEFFICIENT FOR AUTOMAPPING
ECU_24	EFI_CLC1	CLOSED LOOP CONTROL ON LAMBDA1
ECU_25	***NOT AVAILABLE***	
ECU_26	***NOT AVAILABLE***	
ECU_27	***NOT AVAILABLE***	
ECU_28	***NOT AVAILABLE***	
ECU_29	***NOT AVAILABLE***	
ECU_30	***NOT AVAILABLE***	
ECU_31	EFI_TH2O	WATER TEMPERATURE
ECU_32	EFI_TAIR	INTAKE AIR TEMPERATURE

"EFI EUROPE – EURO 6"

- ### EFI ECU to AIM CAN Configuration

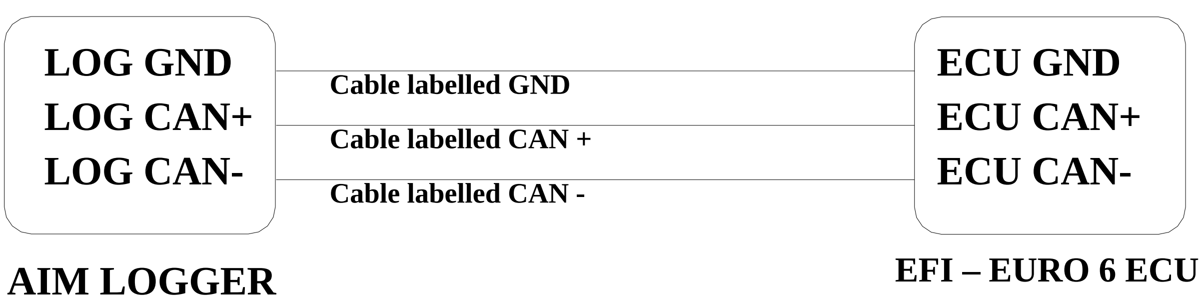
In ECU software, "ECT", you can choose different datasets for CAN protocol management concerning output data:

- UDA 91
- None
- 2D

Please select **2D** protocol

- ### Connection With AIM Data logger

The ECU is equipped with a 79 pins connector used to communicate parameters to an external data logger or to configure the ECU itself.
To connect Your AIM logger to the ECU, please connect cables labelled **CAN +** with **pin 55** of the **ECU** (**CAN +**), cable labelled **CAN –** with **pin 70** of the **ECU** (**CAN -**) and cable called **GND** with the **pin 77** of the **ECU** (**GND**) as shown in the figure below:



Pin	Function	Comments
77	GND / DIG	

55	CAN +
70	CAN -

EFI_EUROPE – EURO_6

ECU_1	EFI_RPM	RPM
ECU_2	EFI_TPS1	THROTTLE POSITION #1
ECU_3	EFI_TPS2	THROTTLE POSITION #2
ECU_4	EFI_MAP	MANIFOLD PRESSURE #1
ECU_5	EFI_MAP2	MANIFOLD PRESSURE #2
ECU_6	EFI_DFARF	TPS DERIVATIVE
ECU_7	EFI_DMAP	MANIFOLD PRESSURE DERIVATIVE
ECU_8	EFI_AE	FUEL ENRICHMENT COEFFICIENT FOR POSITIVE TPS VARIATION
ECU_9	EFI_DE	FUEL ENRICHMENT FOR NEGATIVE TPS VARIATION
ECU_10	EFI_WHEELSPD	DRIVEN WHEEL SPEED
ECU_11	EFI_DRAXSSPD	DRAGGED WHEEL SPEED
ECU_12	EFI_SLIP	DRIVEN/DRAGGED DIFFERENCE %
ECU_13	EFI_OSASLIP	SPARK ADVANCE CORRECTION DUE TO THE SLIP FACTOR
ECU_14	***NOT AVAILABLE***	
ECU_15	***NOT AVAILABLE***	
ECU_16	***NOT AVAILABLE***	
ECU_17	***NOT AVAILABLE***	
ECU_18	EFI_TEROGBASE	EROG TIME ON FUEL TAB
ECU_19	EFI_TEROG	REAL EROG TIME
ECU_20	EFI_SABASE	SPARK ADVANCE ON IGNITION TABLE
ECU_21	EFI_SA	REAL SPARK ADVANCE
ECU_22	EFI_NTK1	LAMBDA VALUE #1
ECU_23	EFI_NTK2	LAMBDA VALUE #2
ECU_24	EFI_KFUELLEARN	FUEL CORRECTION COEFFICIENT FOR AUTOMAPPING
ECU_25	EFI_CLC1	CLOSED LOOP CONTROL ON LAMBDA1
ECU_26	EFI_CLC2	CLOSED LOOP CONTROL ON LAMBDA2
ECU_27	EFI_GEAR	ENGAGED GEAR
ECU_28	***NOT AVAILABLE***	
ECU_29	EFI_GEARSHIFTTIME	IGNITION CUT TIME FOR POWERSHIFT
ECU_30	EFI_OILPRESS	OIL PRESSURE
ECU_31	EFI_FUELPRESS	FUEL PRESSURE
ECU_32	***NOT AVAILABLE***	
ECU_33	***NOT AVAILABLE***	
ECU_34	***NOT AVAILABLE***	
ECU_35	***NOT AVAILABLE***	
ECU_36	EFI_BATTVOLTDIR	BATTERY VOLTAGE
ECU_37	EFI_BATTVOLTKEY	BATTERY VOLTAGE UNDER SWITCH
ECU_38	***NOT AVAILABLE***	
ECU_39	***NOT AVAILABLE***	
ECU_40	***NOT AVAILABLE***	
ECU_41	***NOT AVAILABLE***	
ECU_42	***NOT AVAILABLE***	
ECU_43	***NOT AVAILABLE***	
ECU_44	***NOT AVAILABLE***	
ECU_45	***NOT AVAILABLE***	

ECU_46	***NOT AVAILABLE***	
ECU_47	***NOT AVAILABLE***	
ECU_48	EFI_WATERTEMP	WATER TEMPERATURE
ECU_49	EFI_OILTEMP	OIL TEMPERATURE
ECU_50	EFI_FUELTEMP	FUEL TEMPERATURE
ECU_51	EFI_AIRTEMP01	INTAKE AIR TEMPERATURE #1
ECU_52	EFI_AIRTEMP02	INTAKE AIR TEMPERATURE #2
ECU_53	***NOT AVAILABLE***	
ECU_54	EFI_KFUELCAL	INJECTION TAB TRIM
ECU_55	***NOT AVAILABLE***	
ECU_56	EFI_FUELUSED	FUEL USED
ECU_57	EFI_FUELLEFT	FUEL LEFT

"EFI EUROPE – EURO 12"

- **EFI ECU to AIM CAN Configuration**

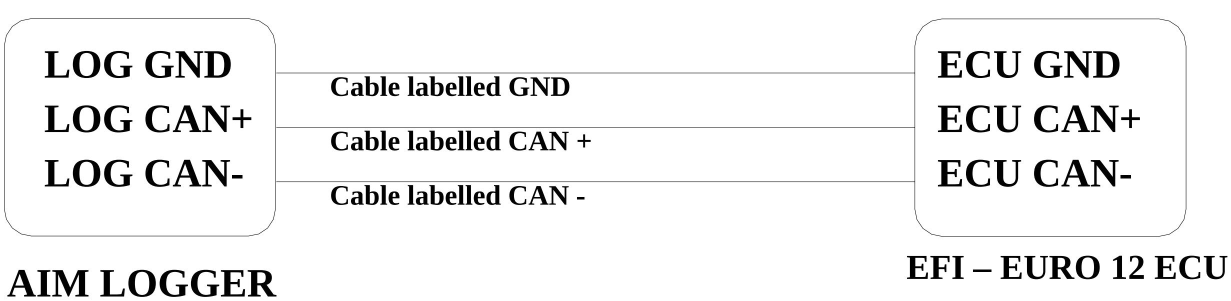
In the ECU software, "ECT", you can choose different dataset for CAN protocol management concerning output data:

- UDA 91
- None
- 2D

Please select **2D** protocol

- **Connection With AIM Data logger**

The ECU is equipped with a 79 pins connector used to communicate parameters to an external data logger or to configure the ECU itself.
To connect Your AIM logger to the ECU, please connect cables labelled **CAN +** with **pin 10** of the **ECU** (**CAN +**), cable labelled **CAN –** with **pin 9** of the **ECU** (**CAN -**) and cable called **GND** with **pin 72** of the **ECU** (**GND**) as shown in the figure below:



Pin	Function	Comments

72	GND
10	CAN +
9	CAN -

EFI_EUROPE – EURO_12

ECU_1	EFI_RPM	RPM
ECU_2	EFI_TPS1	THROTTLE POSITION#1
ECU_3	EFI_TPS2	THROTTLE POSITION#2
ECU_4	EFI_MAP	MANIFOLD PRESSURE#1
ECU_5	EFI_MAP2	MANIFOLD PRESSURE#2
ECU_6	EFI_DFARF	DERIVATIVE TPS
ECU_7	EFI_DMAP	DERIVATIVE MANIFOLD PRESSURE
ECU_8	EFI_AE	FUEL ENRICHMENT COEFFICIENT FOR POSITIVE TPS VARIATION
ECU_9	EFI_DE	FUEL ENRICHMENT FOR NEGATIVE TPS VARIATION
ECU_10	EFI_WHEELSPD	VEHICLE WHEEL SPEED
ECU_11	EFI_DRAXSSPD	***NO INFO AVAILABLE YET***
ECU_12	EFI_SLIP	DRIVEN/DRAGGED DIFFERENCE %
ECU_13	EFI_OSASLIP	SPARK ADVANCE CORRECTION DUE TO THE SLIP FACTOR
ECU_14	***NOT AVAILABLE***	
ECU_15	***NOT AVAILABLE***	
ECU_16	***NOT AVAILABLE***	
ECU_17	***NOT AVAILABLE***	
ECU_18	EFI_TEROGBASE	EROG TIME ON FUEL TAB
ECU_19	EFI_TEROG	REAL EROG TIME
ECU_20	EFI_SABASE	SPARK ADVANCE ON IGNITION TABLE
ECU_21	EFI_SA	REAL SPARK ADVANCE
ECU_22	EFI_NTK1	LAMBDA VALUE #1
ECU_23	EFI_NTK2	LAMBDA VALUE #2
ECU_24	EFI_KFUELLEARN	FUEL CORRECTION COEFFICIENT FOR AUTOMAPPING
ECU_25	EFI_CLC1	CLOSED LOOP CONTROL ON LAMBDA1
ECU_26	EFI_CLC2	CLOSED LOOP CONTROL ON LAMBDA2
ECU_27	EFI_GEAR	ENGAGED GEAR
ECU_28	***NOT AVAILABLE***	
ECU_29	EFI_GEARSHIFTTIME	IGNITION CUT TIME FOR POWERSHIFT
ECU_30	EFI_OILPRESS	OIL PRESSURE
ECU_31	EFI_FUELPRESS	FUEL PRESSURE
ECU_32	***NOT AVAILABLE***	
ECU_33	***NOT AVAILABLE***	
ECU_34	***NOT AVAILABLE***	
ECU_35	***NOT AVAILABLE***	
ECU_36	EFI_BATTVOLTDIR	BATTERY VOLTAGE
ECU_37	EFI_BATTVOLTKEY	BATTERY VOLTAGE UNDER SWITCH
ECU_38	***NOT AVAILABLE***	
ECU_39	***NOT AVAILABLE***	
ECU_40	***NOT AVAILABLE***	
ECU_41	***NOT AVAILABLE***	
ECU_42	***NOT AVAILABLE***	
ECU_43	***NOT AVAILABLE***	
ECU_44	***NOT AVAILABLE***	

ECU_45	***NOT AVAILABLE***	
ECU_46	***NOT AVAILABLE***	
ECU_47	***NOT AVAILABLE***	
ECU_48	EFI_WATERTEMP	WATER TEMPERATURE
ECU_49	EFI_OILTEMP	OIL TEMPERATURE
ECU_50	EFI_FUELTEMP	FUEL TEMPERATURE
ECU_51	EFI_AIRTEMP01	INTAKE AIR TEMPERATURE #1
ECU_52	EFI_AIRTEMP02	INTAKE AIR TEMPERATURE #2
ECU_53	***NOT AVAILABLE***	
ECU_54	EFI_KFUELCAL	INJECTION TAB TRIM
ECU_55	***NOT AVAILABLE***	
ECU_56	EFI_FUELUSED	FUEL USED
ECU_57	EFI_FUELLEFT	FUEL LEFT

"EFI EUROPE – EURO 96"

- **EFI ECU to AIM CAN Configuration**

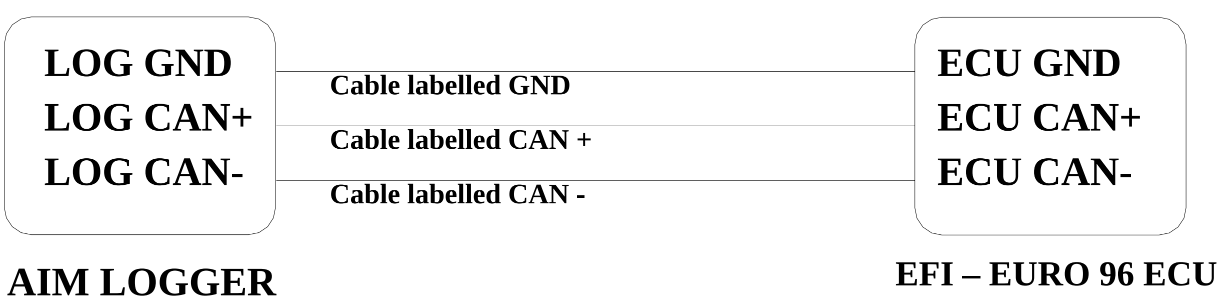
In ECU software, "ECT", you can choose different datasets for CAN protocol management concerning output data:

- UDA 91
- None
- 2D

Please select **2D** protocol

- **Connection With AIM Data logger**

The ECU is equipped with a 79 pins connector used to communicate parameters to an external data logger or to configure the ECU itself. This connection should not change with different firmware versions.
To connect Your AIM logger to the ECU, please connect cables labelled **CAN +** with **pin 55** of the ECU (**CAN +**), cable labelled **CAN –** with **pin 70** of the ECU (**CAN -**) and cable called **GND** with the **pin 77** of the ECU (**GND**) as shown in the figure below:



Pin	Function	Comments
77	GND	
55	CAN +	
70	CAN -	

EFI_EUROPE – EURO_96

ECU_1	EFI_RPM	RPM
ECU_2	EFI_TPS	THROTTLE POSITION
ECU_3	EFI_DFARF	TPS DERIVATIVE
ECU_4	EFI_MAP	MANIFOLD PRESSURE
ECU_5	EFI_BARO	BAROMETRIC PRESSURE
ECU_6	EFI_POIL	OIL PRESSURE
ECU_7	EFI_PFUEL	FUEL PRESSURE
ECU_8	EFI_ARR_TRANS	***NO INFO AVAILABLE YET***
ECU_9	EFI_SPEED	VEHICLE SPEED
ECU_10	EFI_VBATT	BATTERY VOLTAGE
ECU_11	***NOT AVAILABLE***	
ECU_12	***NOT AVAILABLE***	
ECU_13	***NOT AVAILABLE***	
ECU_14	***NOT AVAILABLE***	
ECU_15	EFI_TEROGBASE	EROG TIME ON FUEL TAB
ECU_16	EFI_TEROG	REAL EROG TIME
ECU_17	EFI_TEROG1	EROG TIME FOR CYLINDER 1
ECU_18	EFI_TEROG2	EROG TIME FOR CYLINDER 2
ECU_19	EFI_SABASE	SPARK ADVANCE ON IGNITION TABLE
ECU_20	EFI_SA	REAL SPARK ADVANCE
ECU_21	EFI_SA1	SPARK ADVANCE FOR CYLYNDER 1
ECU_22	EFI_SA2	SPARK ADVANCE FOR CYLYNDER 2
ECU_23	EFI_NTK1	LAMBDA VALUE #1
ECU_24	EFI_FCCLAT	***NO INFO AVAILABLE YET***
ECU_25	EFI_KFUELLEARN	FUEL CORRECTION COEFFICIENT FOR AUTOMAPPING
ECU_26	EFI_CLC1	CLOSED LOOP CONTROL ON LAMBDA1
ECU_27	***NOT AVAILABLE***	
ECU_28	***NOT AVAILABLE***	
ECU_29	***NOT AVAILABLE***	
ECU_30	***NOT AVAILABLE***	
ECU_31	***NOT AVAILABLE***	
ECU_32	***NOT AVAILABLE***	
ECU_33	EFI_TH2O	WATER TEMPERATURE
ECU_34	EFI_TOIL	OIL TEMPERATURE
ECU_35	EFI_TFUEL	FUEL TEMPERATURE
ECU_36	EFI_TAIR	INTAKE AIR TEMPERATURE
ECU_37	***NOT AVAILABLE***	
ECU_38	***NOT AVAILABLE***	
ECU_39	***NOT AVAILABLE***	
ECU_40	EFI_KFUELCAL	INJECTION TAB TRIM
ECU_41	EFI_FUEL_USED	FUEL USED

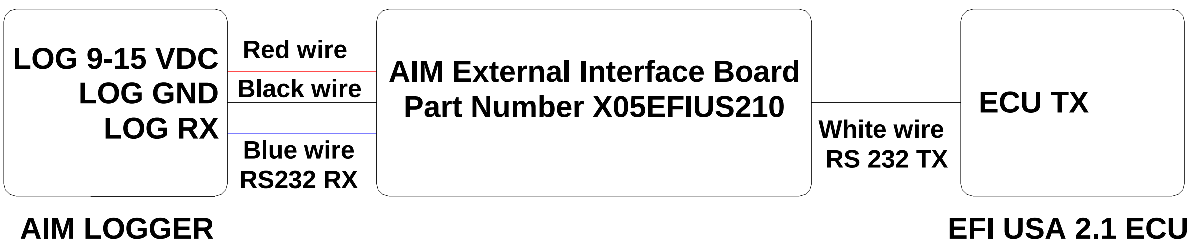
"EFI USA – 2.1"

• ECU communication protocol: general information

The "available channels list" you find inside **Race Studio 2** "Configuration" window is inferred from the ECU's communication protocol.
The communication protocol includes all the available channels of an EFI USA 2.1. ECU. The ECU is equipped with a 55 pins Deutsch connector used to communicate with an external data logger or to configure the ECU itself.

• AIM External Interface Board connection

To connect this ECU to AIM Loggers you need an external interface board supplied by AIM (Part Number **X05EFIUS210**). This board needs to be connected to both the 55 pins Deutsch connector of the ECU and to AIM Logger as shown below.



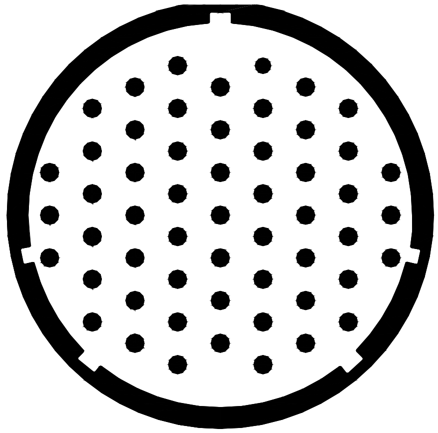
The External interface board has all wires already labelled as follows:

- **Red wire**: 9-15 VDC to connect to 9-15 VDC pin of AIM Logger
- **Black wire**: GND to connect to GND pin of AIM Logger
- **Blue wire**: Data out to connect to RS232RX pin of AIM Logger
- **White wire**: Data in to connect to **pin "L" of the ECU 55 pins Deutsch connector**.

Warning: please ensure that ECU GND, AIM External Interface Board GND and AIM Logger GND are the same (in the pinout table below reported GND has been connected to pin "AA").

• EFI USA 2.1 – 55 Pins Deutsch connector pinout

The ECU is equipped with a 55 pins Deutsch connector, shown below and its pinout is described in the following table.



Pin	Description	Pin	Description
A	INJ1	f	Cam
B	INJ2	g	Oil P
C	INJ3	h	Boost sw
D	INJ4	i	Beacon
E	Pump	j	Lambda
F	Duty1	k	Mixture
G	Duty2	m	Fuel T
H	Heater	n	Air T
J	Vref	p	Water T
K	Vref	q	Oil T
L	**TXD**	r	Tach
M	**ECU 12v**	s	IGN1
N	FCM/DC2	t	IGN2
P	Lamp/Dc1	u	IGN3
R	INJ6	v	IGN4
S	INJ7	w	IGN5/Step1+
T	INJ8	x	IGN6/Step1-
U	INJ5	y	IGN7/Step2+
V	SW 1	z	IGN8/Step2-
W	SW2	**AA**	**GND**
X	MAP	BB	GND
Y	Fuel P	CC	GND
Z	Wheel	DD	GND
a	Wheel2	EE	GND
b	TPS	FF	GND
c	NGK/Knock	GG	GND
d	Crank	HH	GND
e	EBP		

EFI_USA – 2.1

ECU_1 EFI_RPM RPM

ECU_2	EFI_BATTERY	BATTERY VOLTAGE
ECU_3	EFI_THROTTLE	THROTTLE POSITION
ECU_4	EFI_MAP	MANIFOLD PRESSURE
ECU_5	EFI_SHIFTCUT	GEAR SHIFTCUT
ECU_6	EFI_FUEL_PRESSURE	FUEL PRESSURE
ECU_7	EFI_OILP_PRESSURE	OIL PRESSURE
ECU_8	EFI_BEACON	BEACON SIGNAL
ECU_9	EFI_FUEL_TEMP	FUEL TEMPERATURE
ECU_10	EFI_AIR_TEMP	INTAKE AIR TEMPERATURE
ECU_11	EFI_WATER_TEMP	WATER TEMPERATURE
ECU_12	EFI_OIL_TEMP	OIL TEMPERATURE
ECU_13	EFI_ECU_TEMP	ECU TEMPERATURE
ECU_14	EFI_LAMBDA1	LAMBDA VALUE #1
ECU_15	EFI_LAMBDA2	LAMBDA VALUE #2
ECU_16	EFI_SPEED	VEHICLE SPEED
ECU_17	EFI_LAPCOUNT	LAP COUNTER
ECU_18	EFI_GEAR_POSITION	ENGAGED GEAR
ECU_19	EFI_FUEL_SWITCH	FUEL SWITCH ON/OFF
ECU_20	EFI_LAMBDA_TEMP	LAMBDA PROBE TEMPERATURE
ECU_21	EFI_LATERAL_G	LATERAL G
ECU_22	EFI_DUTY1	DUTY CYCLE#1
ECU_23	EFI_DUTY2	DUTY CYCLE#2
ECU_24	EFI_CDI_TEMP	ECU TEMPERATURE
ECU_25	EFI_RAW_GEAR	RAW GEAR VALUE
ECU_26	RESERVED	RESERVED CHANNEL
ECU_27	RESERVED	RESERVED CHANNEL
ECU_28	EFI_FUEL	FUEL INDICATOR

"ELECTROMOTIVE – TEC3"

ELECTROMOTIVE – TEC3

ECU_1	TEC3_RPM	RPM
ECU_2	TEC3_ADVANCE	SPARK ADVANCE
ECU_3	TEC3_MAP	MANIFOLD PRESSURE
ECU_4	TEC3_ECT	ENGINE COOLANT TEMPERATURE
ECU_5	TEC3_TFPW	TIME FUEL PULSE WIDTH
ECU_6	TEC3_KNOCK	KNOCK COUNTER
ECU_7	TEC3_MAT	MANIFOLD AIR TEMPERATURE
ECU_8	TEC3_TPS	THROTTLE POSITION
ECU_9	TEC3_BATV	BATTERY VOLTAGE
ECU_10	TEC3_ENGINE_LIGHT	***NO INFO AVAILABLE YET***
ECU_11	TEC3_GPO1	GENERAL PURPOSE OUTPUT#1
ECU_12	TEC3_UAP	***NO INFO AVAILABLE YET***
ECU_13	TEC3_ACTUAL_AFR	ACTUAL AIR/FUEL RATIO
ECU_14	TEC3_EGO	LAMBDA VALUE
ECU_15	TEC3_DESIRED_AFR	DESIRED AIR/FUEL RATIO
ECU_16	TEC3_EGO_VOLT	LAMBDA VOLTAGE
ECU_17	TEC3_TPS_BLEND_OFFSET	***NO INFO AVAILABLE YET***
ECU_18	TEC3_STAGED_PW	***NO INFO AVAILABLE YET***
ECU_19	TEC3_PRIMARY_PW	***NO INFO AVAILABLE YET***
ECU_20	TEC3_AD_INPUT1	***NO INFO AVAILABLE YET***

ECU_21	TEC3_AD_INPUT2	***NO INFO AVAILABLE YET***
ECU_22	TEC3_AD_INPUT3	***NO INFO AVAILABLE YET***
ECU_23	TEC3_AD_INPUT4	***NO INFO AVAILABLE YET***
ECU_24	TEC3_GPO2	***NO INFO AVAILABLE YET***
ECU_25	TEC3_GPO3	***NO INFO AVAILABLE YET***
ECU_26	TEC3_GPO4	***NO INFO AVAILABLE YET***
ECU_27	TEC3_SECONDARY_ADV	SECONDARY IGNITION ADVANCE
ECU_28	TEC3_KNK_RETARD	KNOCK ANGLE

"EMS - STINGER"

EMS – STINGERV123

ECU_1	EMS_ENGINESPD	RPM
ECU_2	EMS_MAINPRESS	MANIFOLD PRESSURE
ECU_3	EMS_AFR	AIR/FUEL RATIO
ECU_4	EMS_IGN_TIMING	IGNITION TIME
ECU_5	EMS_THROTTLE	THROTTLE POSITION
ECU_6	EMS_INJ_MS	INJECTION TIME
ECU_7	EMS_BATTVOLT	BATTERY VOLTAGE
ECU_8	EMS_ENGTEMP	ENGINE TEMPERATURE
ECU_9	EMS_AIRTEMP	INTAKE AIR TEMPERATURE

EMS – STINGERV4

ECU_1	EMS_ENGINESPD	RPM
ECU_2	EMS_MAINPRESS	MANIFOLD PRESSURE
ECU_3	EMS_THROTTLE	THROTTLE POSITION
ECU_4	EMS_AIRFUELRATIO1	AIR/FUEL RATIO#1
ECU_5	EMS_AIRFUELRATIO2	AIR/FUEL RATIO#2
ECU_6	EMS_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_7	EMS_ENGTEMP	ENGINE TEMPERATURE
ECU_8	EMS_IGN_TIMING	IGNITION TIME
ECU_9	EMS_INJ_US	INJECTION TIME
ECU_10	EMS_STAGEDINJ	***NO INFO AVAILABLE YET***
ECU_11	EMS_BATTERY	BATTERY VOLTAGE

EMS – STINGERV8860

ECU_1	EMS_ENGINESPD	RPM
ECU_2	EMS_MAINPRESS	MANIFOLD PRESSURE
ECU_3	EMS_THROTTLE	THROTTLE POSITION
ECU_4	EMS_AIRFUELRATIO1	AIR/FUEL RATIO#1
ECU_5	EMS_AIRFUELRATIO2	AIR/FUEL RATIO#2
ECU_6	EMS_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_7	EMS_ENGTEMP	ENGINE TEMPERATURE
ECU_8	EMS_IGN_TIMING	IGNITION TIME
ECU_9	EMS_INJ_US	INJECTION TIME
ECU_10	EMS_STAGEDINJ	***NO INFO AVAILABLE YET***
ECU_11	EMS_BATTERY	BATTERY VOLTAGE

"FORD – FOCUS 2005/2007"

FORD – FOCUS 2005_2007

ECU_1	FOCUS_RPM	RPM
ECU_2	FOCUS _SPEED	VEHICLE SPEED
ECU_3	FOCUS _PEDAL_POS	THROTTLE PEDAL POSITION
ECU_4	FOCUS _WH_SPD_FL	FRONT LEFT WHEEL SPEED
ECU_5	FOCUS _WH_SPD_FR	FRONT RIGHT WHEEL SPEED
ECU_6	FOCUS _WH_SPD_RL	REAR LEFT WHEEL SPEED
ECU_7	FOCUS _WH_SPD_RR	REAR RIGHT WHEEL SPEED
ECU_8	FOCUS _TENGINE	ENGINE TEMPERATURE
ECU_9	***NOT AVAILABLE***	
ECU_10	***NOT AVAILABLE***	
ECU_11	FOCUS _FUEL_PULSE	FUEL PULSE
ECU_12	FOCUS _FUEL_LEVEL	FUEL LEVEL
ECU_13	FOCUS _TYRE_FRONT	FRONT TYRES CIRCUMFERENCE
ECU_14	FOCUS _TYRE_REAR	REAR TYRES CIRCUMFERENCE

"FORD – FOCUS PZEV 2003/2004"

FORD – FOCUS PZEV_2003_2004

ECU_1	FOCUS _RPM	RPM
ECU_2	FOCUS _SPEED	VEHICLE SPEED
ECU_3	FOCUS _PEDAL_POS	THROTTLE PEDAL POSITION
ECU_4	FOCUS _TENGINE	ENGINE TEMPERATURE
ECU_5	FOCUS _FUEL_PULSE	FUEL PULSE
ECU_6	FOCUS _FUEL_LEVEL	FUEL LEVEL
ECU_7	FOCUS _TYRE_FRONT	FRONT TYRES CIRCUMFERENCE
ECU_8	FOCUS _TYRE_REAR	FRONT TYRES CIRCUMFERENCE
ECU_9	FOCUS _BRAKE_SWITCH	BRAKE SWITCH ON/OFF

"FORD – FR500C"

FORD – FR500C

ECU_1	FR500C_WHEELSPEED	VEHICLE SPEED
ECU_2	FR500C_LOAD	ENGINE LOAD
ECU_3	FR500C_DESIRED_LAMBDA	DESIRED LAMBDA VALUE
ECU_4	FR500C_WATERTEMP	WATER TEMPERATURE
ECU_5	FR500C_FUELPRESS	FUEL PRESSURE
ECU_6	FR500C_BATTVOLT	BATTERY VOLTAGE
ECU_7	FR500C_TPS	THROTTLE POSITION
ECU_8	FR500C_LH_LAMBDA	LEFT BANK LAMBDA
ECU_9	FR500C_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_10	FR500C_EXHAUST_TEMP	EXHAUST TEMPERATURE
ECU_11	FR500C_RH_LAMBDA	RIGHT BANK LAMBDA
ECU_12	FR500C_TRANS_TEMP	TRANSM. BOX TEMPERATURE

ECU_13	FR500C_GEAR	ENGAGED GEAR
ECU_14	FR500C_SYNC_LEVEL	

"FORD – MUSTANG 2005-2007"

FORD – MUSTANG

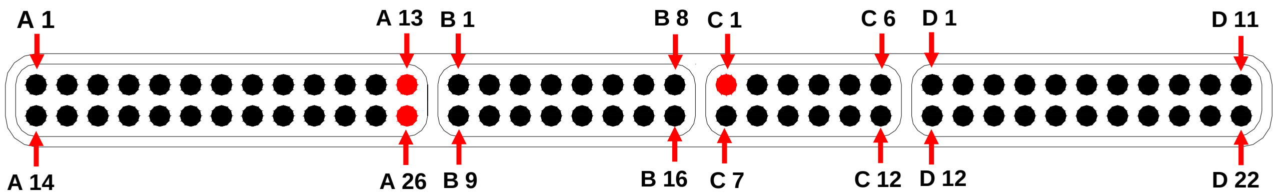
ECU_1	MUSTANG_RPM	RPM
ECU_2	MUSTANG_SPEED	VEHICLE SPEED
ECU_3	MUSTANG_PEDAL_POS	THROTTLE POSITION
ECU_4	MUSTANG_WH_SPD_FL	FRONT LEFT WHEEL SPEED
ECU_5	MUSTANG_WH_SPD_FR	FRONT REAR WHEEL SPEED
ECU_6	MUSTANG_WH_SPD_RL	REAR LEFT WHEEL SPEED
ECU_7	MUSTANG_WH_SPD_RR	REAR RIGHT WHEEL SPEED
ECU_8	MUSTANG_TENGINE	ENGINE COOLANT TEMPERATURE
ECU_9	MUSTANG_ETC_TELTAL	ENGINE TRACTION CONTROL TELL TALE
ECU_10	MUSTANG_TBO_BST	TURBO BOOST
ECU_11	MUSTANG_FUEL_LEV	FUEL LEVEL (2005 MODELS)
ECU_12	MUSTANG_FUEL_I_1	SENSOR#1 INSTANT FUEL LEVEL
ECU_13	MUSTANG_FUEL_I_2	SENSOR#2 INSTANT FUEL LEVEL
ECU_14	MUSTANG_FUEL_AVE	AVERAGE FUEL LEVEL
ECU_15	MUSTANG_FFLUX	FUEL FLUX
ECU_16	MUSTANG_CLCH_SW	CLUTCH SWITCH ON/OFF
ECU_17	MUSTANG_TCS_BRK	TRACTION CONTROL BRAKE SWITCH
ECU_18	MUSTANG_TCS_ENG	TRACTION CONTROL ENGINE SWITCH
ECU_19	MUSTANG_BRK_SW	BRAKE SWITCH ON/OFF
ECU_20	MUSTANG_ABS_TELTAL	ABS TELL TALE
ECU_21	MUSTANG_ABS_AXLE_RATIO_R	***NO INFO AVAILABLE YET***
ECU_22	MUSTANG_MIL_TELTAL	***NO INFO AVAILABLE YET***
ECU_23	MUSTANG_FAILSAFE_COOL	***NO INFO AVAILABLE YET***
ECU_24	MUSTANG_GEAR	ENGAGED GEAR
ECU_25	MUSTANG_TYRE	TYRE REVS PER KM

"GEMS – OMEX"

- **Serial Communication Set-Up**

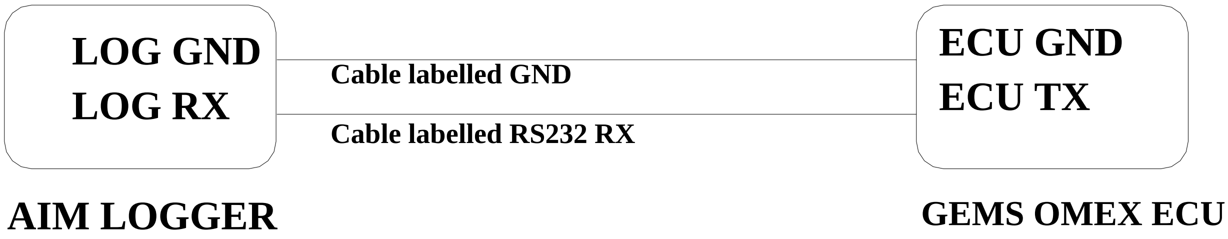
The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger or to configure the ECU itself. The ECU connector is made of four sections: "A", "B", "C", and "D" so characterised:
"A" - 26 pins
"B" - 16 pins
"C" - 12 pins
"D" – 22 pins

GEMX OMEX connector is shown below:



- **Connection With AIM Data logger**

Connect the cable called **RS 232 RX** with **pin** "**C1**" of the **ECU** (**ECU TX**) and cable called **GND** with **pin** "**A 13**" **or** with the **pin** "**A 26**" of the **ECU** (**GND** pins) as shown in the figure below:



GEMS – OMEX

ECU_1	GEMS_ENGINESPD	RPM
ECU_2	GEMS_LOAD	ENGINE LOAD
ECU_3	GEMS_TPS	THROTTLE POSITION
ECU_4	GEMS_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	GEMS_COOLTEMP	WATER TEMPERATURE
ECU_6	GEMS_BATTVOLT	BATTERY VOLTAGE
ECU_7	GEMS_ACCFUEL	***NO INFO AVAILABLE YET***
ECU_8	GEMS_RESULT	***NO INFO AVAILABLE YET***
ECU_9	GEMS_ADV2	IGNITION ADVANCE#2
ECU_10	GEMS_ERROR	ERROR SIGNAL

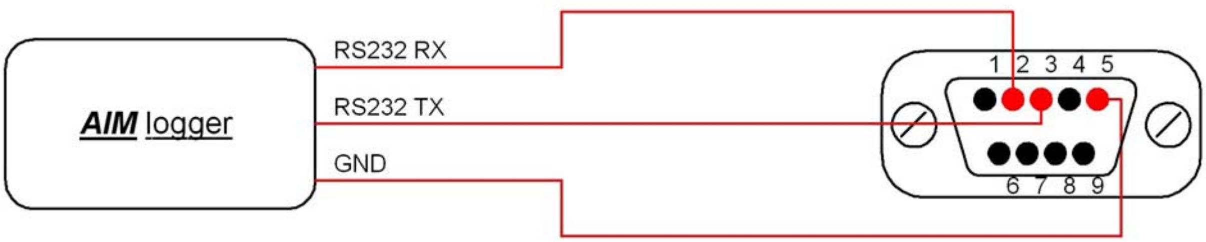
“HALTECH – E11V2”

This ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECUs itself.

- **Connection With AIM Data logger**

AIM loggers can be connected to HALTECH E11V2 ECUs by means of the DB9 serial port according to the following wiring scheme:

- Connect the AIM cable labeled “RS 232 RX” with DB9 female Pin 2
- Connect the AIM cable labeled “RS 232 TX” with DB9 female Pin 3



HALTECH – E11V2

ECU_1	HALTECH_RPM	RPM
ECU_2	HALTECH_MAP_3BAR	MANIFOLD PRESSURE
ECU_3	HALTECH_TPS	THROTTLE POSITION
ECU_4	HALTECH_LOAD	ENGINE LOAD
ECU_5	HALTECH_WATER_TEMP	WATER TEMPERATURE
ECU_6	HALTECH_INTAKE_AIR_TEMP	INTAKE AIR TEMPERATURE
ECU_7	HALTECH_BARO_PRESS	BAROMETRIC PRESSURE
ECU_8	HALTECH_ENG_RUNN_SEC	RUNNING TIME SINCE ENGINE ON
ECU_9	HALTECH_AIR/FUEL_MIX	AIR/FUEL RATIO
ECU_10	HALTECH_BATT_VOLT	BATTERY VOLTAGE
ECU_11	HALTECH_ROAD_SPEED	VEHICLE SPEED
ECU_12	HALTECH_INJ_TIME_ADV	INJECTION ADVANCE TIME
ECU_13	HALTECH_CALC_ADV	CALCULATED INJECTION ADVANCE ANGLE
ECU_14	HALTECH_INJ_ADV	INJECTION ADVANCE ANGLE
ECU_15	HALTECH_SEC_INJ_TIME	INJECTION TIME
ECU_16	HALTECH_SEC_INJ_ADV	INJECTION ADVANCE TIME
ECU_17	HALTECH_INJ_DUTY	INJECTION DUTY CYCLE
ECU_18	HALTECH_SEC_INJ_DUTY	SECONDARY INJ. DUTY CYCLE
ECU_19	HALTECH_GEAR	ENGAGED GEAR

“HONDATA – K-PRO”

• Serial Communication Set-Up

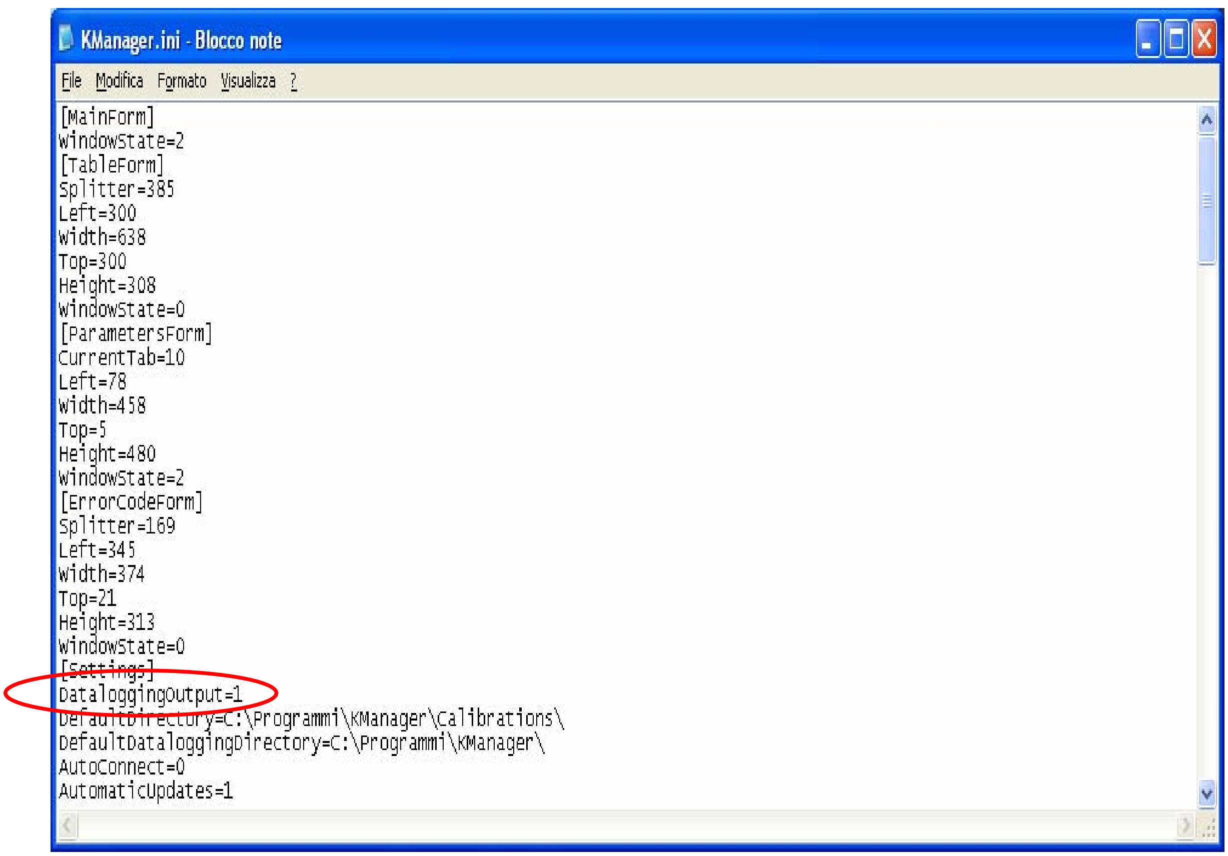
Before starting the connection procedure, please remember that you will need a custom “Hondata board” made by AIM

In order to connect the K-PRO ECU you need to:

- install the KManager software (available on http://www.hondata.com website)

- Locate and edit the KManager.ini file. This file is located in the KManager installation directory.

- Under the [Settings] line, add a new line DataloggingOutput=1

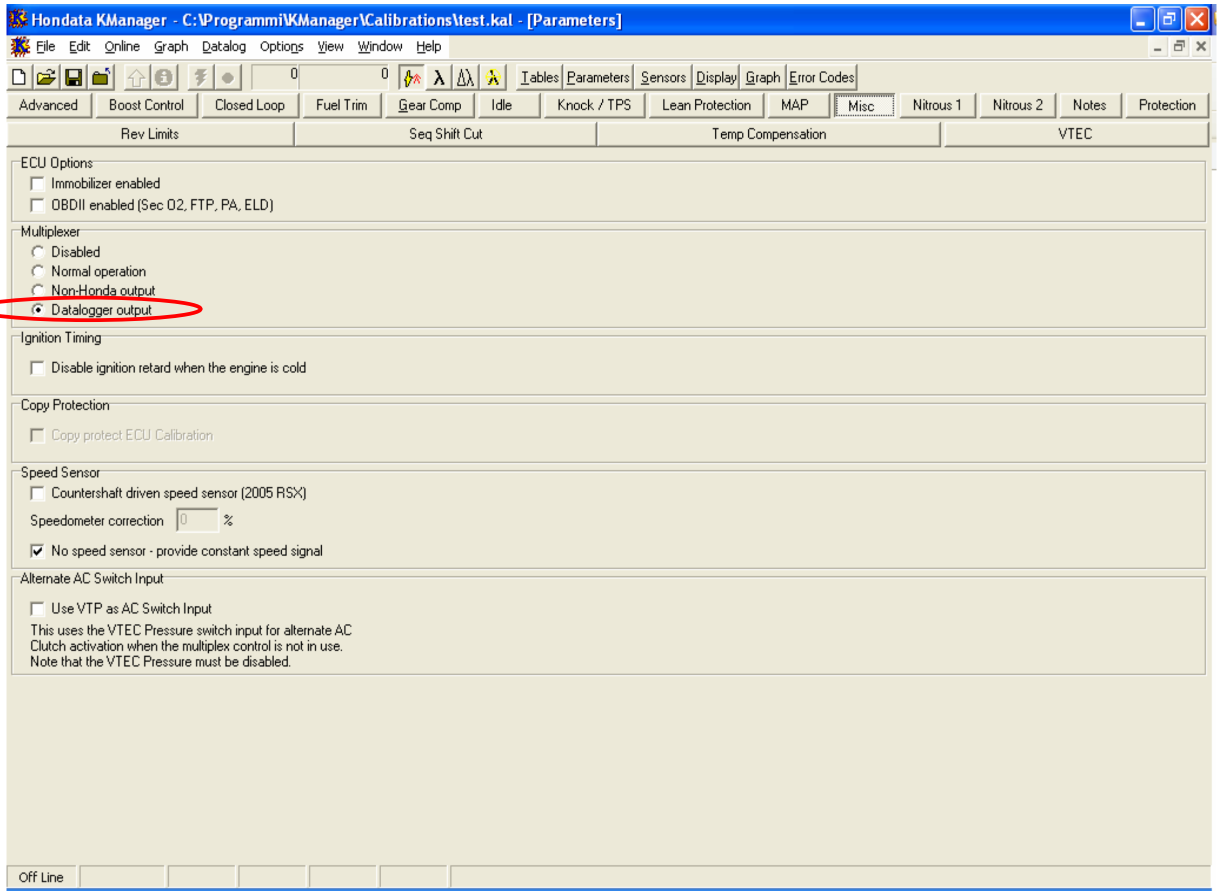


KManager.ini - Blocco note

File Modifica Formato Visualizza ?

```
[MainForm]
WindowState=2
[TableForm]
Splitter=385
Left=300
Width=638
Top=300
Height=308
WindowState=0
[ParametersForm]
CurrentTab=10
Left=78
Width=458
Top=5
Height=480
WindowState=2
[ErrorCodeForm]
Splitter=169
Left=345
Width=374
Top=21
Height=313
WindowState=0
[Settings]
DataloggingOutput=1
DefaultDirectory=C:\Programmi\KManager\Calibrations\
DefaultDataloggingDirectory=C:\Programmi\KManager\
AutoConnect=0
AutomaticUpdates=1
```

- Create a calibration.
- In KManager under Parameters, Misc, Multiplexer select the 'Datalogger Output' option.

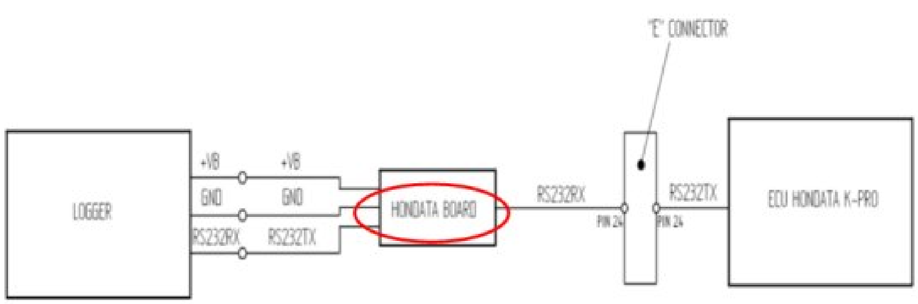


- power the ECU on
- upload the calibration to the ECU
- connect your dash/datalogger to pin E24 (you should see a serial stream on E24 whenever the ECU is powered up).

• Connection With AIM Data logger

- Connect the pin 24 of the E connector to the RS232RX of the board and the Vb, GND with the VB and ground of the logger
- Connect the RS232TX of the board to the RS232Rx of the logger

HONDATA K-PRO ECU INTERFACE



HONDATA – KPRO

ECU_1	HONDATA_RPM	RPM
ECU_2	HONDATA_SPEED	VEHICLE SPEED
ECU_3	HONDATA_GEAR	ENGAGED GEAR
ECU_4	HONDATA_ECT	ENGINE TEMPERATURE
ECU_5	HONDATA_IAT	INTAKE AIR TEMPERATURE
ECU_6	HONDATA_BATTERY	BATTERY VOLTAGE
ECU_7	HONDATA_TPS	THROTTLE POSITION
ECU_8	HONDATA_MAP	MANIFOLD PRESSURE
ECU_9	HONDATA_INJECTOR_TIME	INJECTION TIME
ECU_10	HONDATA_IGNITION_PHASE	IGNITION PHASE
ECU_11	HONDATA_REVERSE_LOCKOUT	REVERSE LOCKOUT
ECU_12	HONDATA_BRAKE_SWITCH	BRAKE INDICATOR
ECU_13	HONDATA_SCS	***NO INFO AVAILABLE YET***
ECU_14	HONDATA_EPS	***NO INFO AVAILABLE YET***
ECU_15	HONDATA_FUEL_PUMP	FUEL PUMP INDICATOR
ECU_16	HONDATA_RADIATOR_FAN	RADIATOR FAN INDICATOR
ECU_17	HONDATA_VTEC_OIL_PRESS	OIL PRESSURE
ECU_18	HONDATA_VTEC_SOLENOID1	SOLENOID INDICATOR #1
ECU_19	HONDATA_VTEC_SOLENOID2	SOLENOID INDICATOR #2
ECU_20	HONDATA_MIL	MALFUNCTION INDICATOR LAMP
ECU_21	HONDATA_CAM_ANGLE	CAM ANGLE
ECU_22	HONDATA_LAMBDA	LAMBDA VALUE
ECU_23	HONDATA_KNOCK_COUNT	KNOCKS SINCE POWER-ON

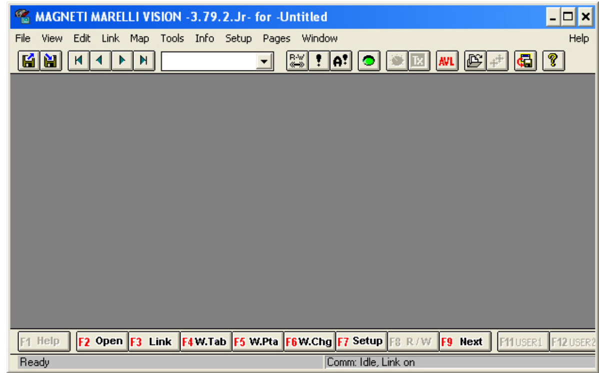
"MARELLI – Customer Protocol (12 channels configuration)"

- **ECU Marelli configuration**

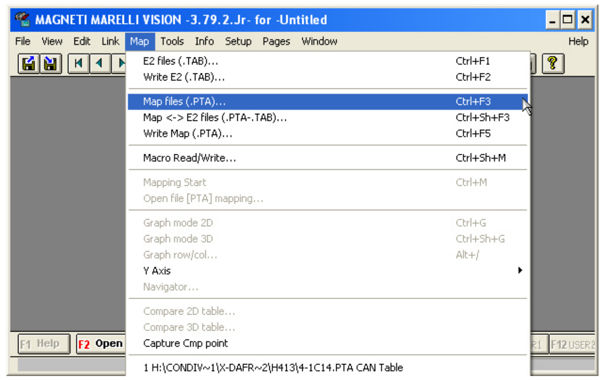
Marelli ECUs can be configured so to communicate with AIM logger through Vision Software (the software properly developed by Marelli for their ECU). This communication protocol is called "Customer Protocol" because is a configuration you can set, with few differences, on more ECUs. At present available configurations are for Marelli MF4 and Marelli RSA. Others are following.

Customer protocol: Marelli MF4

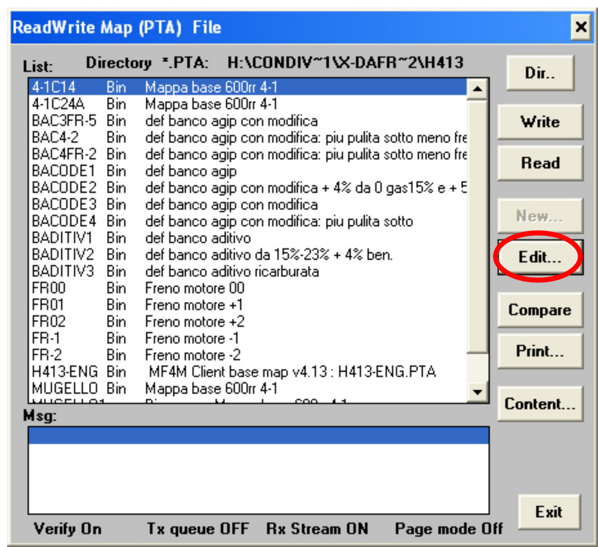
First of all, please run Vision Software. The window on the right appears



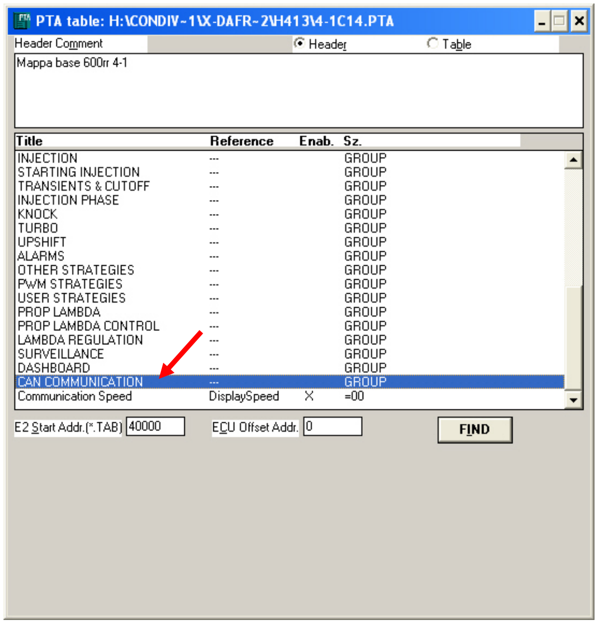
Please click on "Map" button on the top toolbar and select Map Files (PTA)…



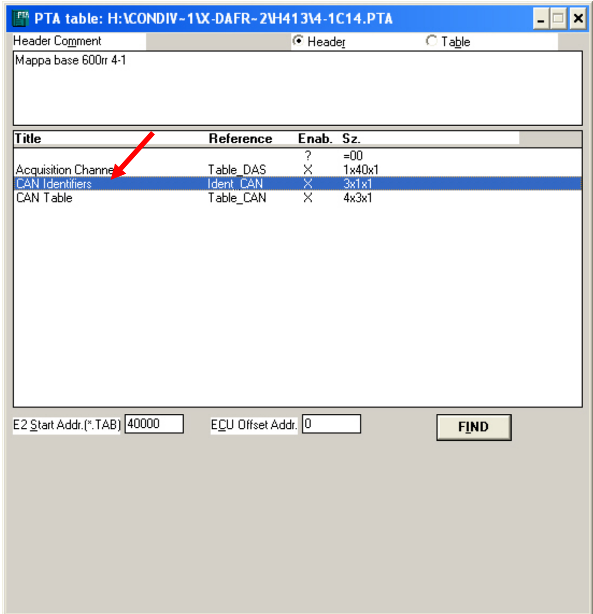
"ReadWrite Map (PTA) File" window appears. Please press "Edit" button.



"PTA table" window appears. Please scroll the until "CAN COMMUNICATION" option and double click on it.



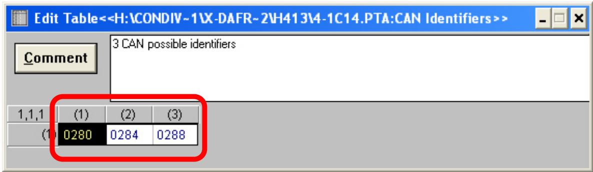
The window on the right appears. Please double click on "CAN Identifiers" option.



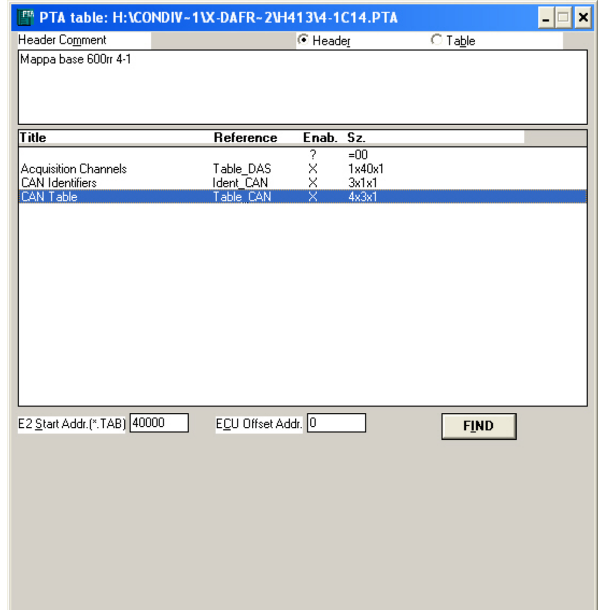
"Edit Table" window appears. Please insert the following values:

- column (1): 280
- column (2): 284
- column (3): 288

and close the window.



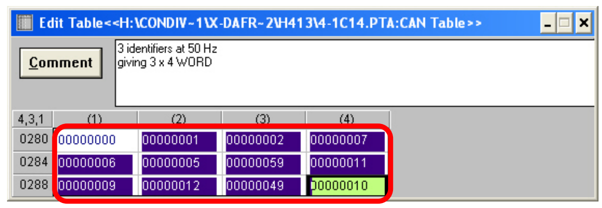
The window on the right appears again. Please double click on “CAN Table” option.



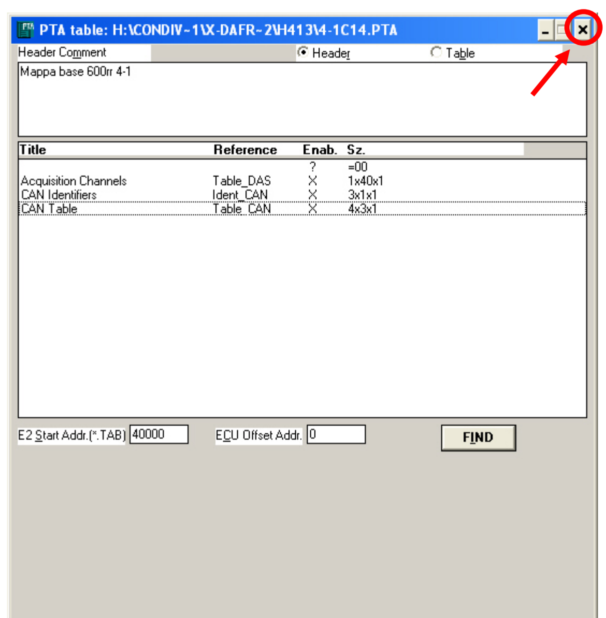
“Edit Table” window appears again. Please insert the following values:

- row 0280: **0, 1, 2, 7**
- row 0284: **6, 5, 59, 11**
- row 0288: **9, 12, 49, 10**

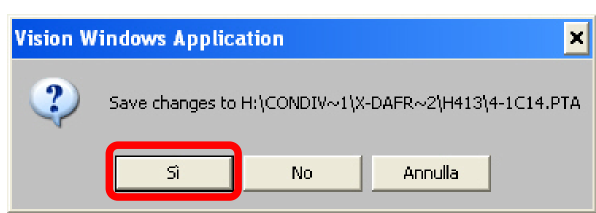
and close the window.



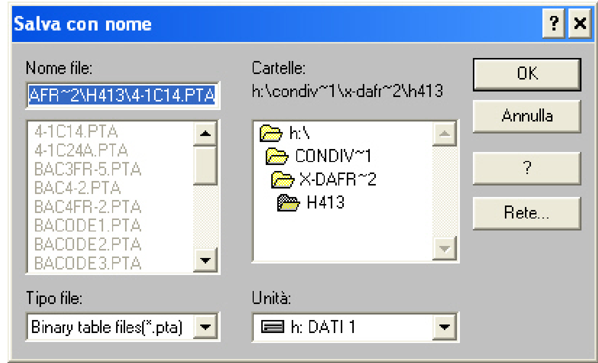
The window on the right appears; please close it clicking on the cross on the top right corner.



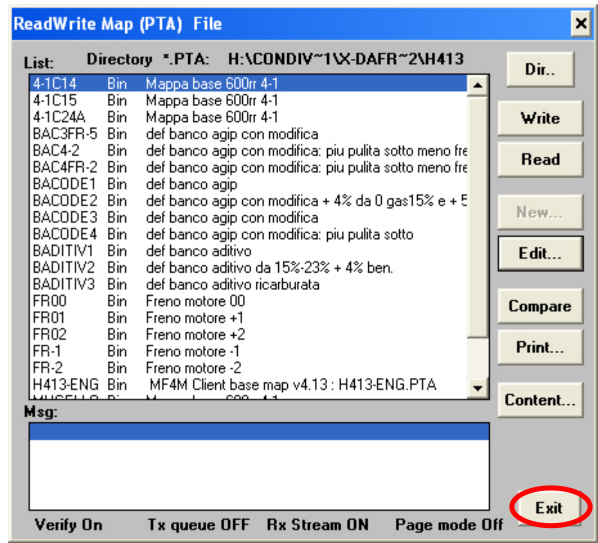
“Vision Windows Application” window appears, asking if you want to save changes. Please click on “Yes” button



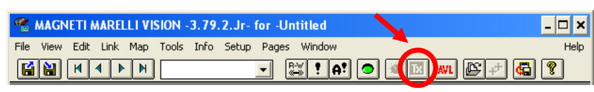
“Save as” window appears. Please insert file name in the proper cell, choose file destination folder and then click on “OK” button.



“ReadWrite Map (PTA) File” window appears. Please click on Exit button.

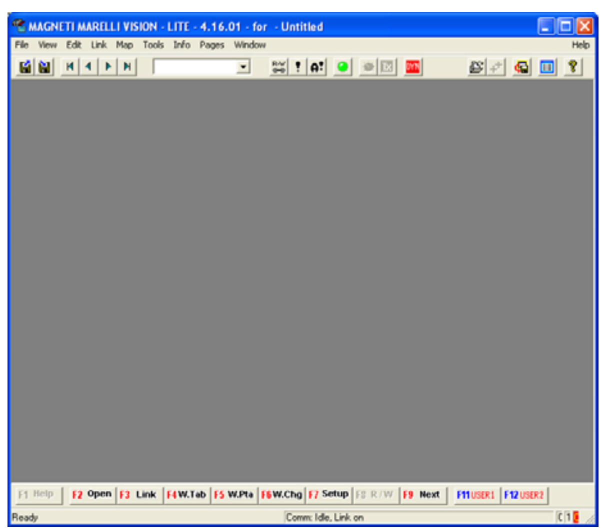


It is now necessary to transmit this configuration to your ECU. “TX” button, on the icons toolbar becomes enabled: please press it.

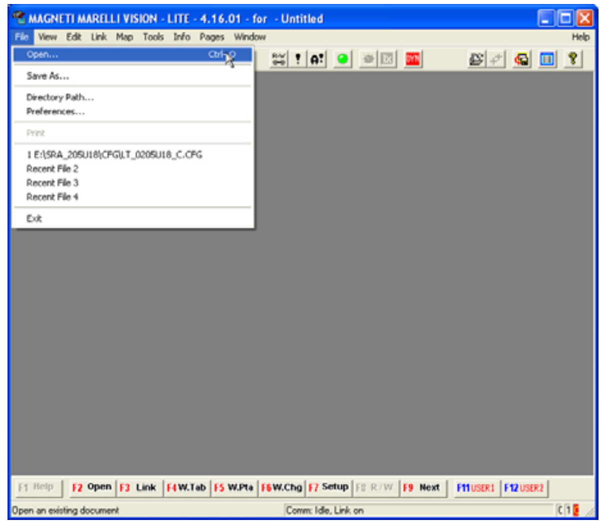


Customer protocol: Marelli RSA

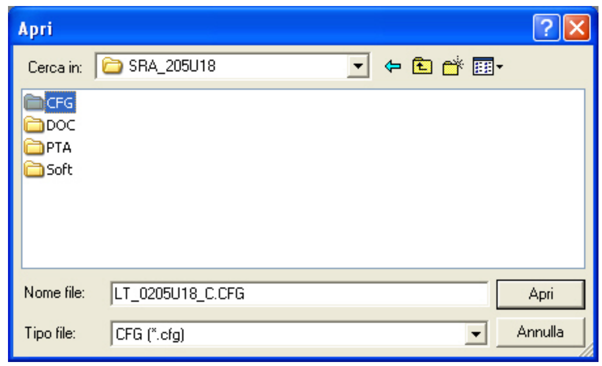
First of all, please run Marelli “Vision” software. First software window appears.



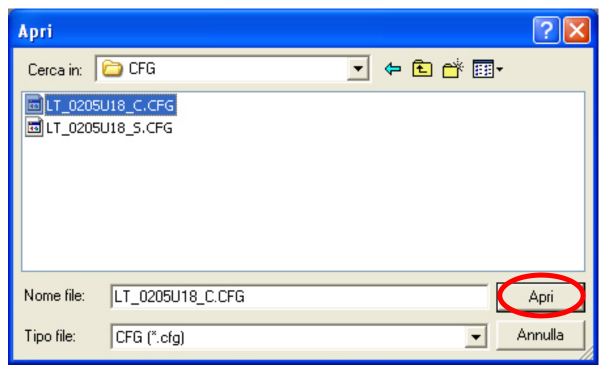
Please click on “File” button on the top toolbar and select “Open” option, as in the figure on the right.



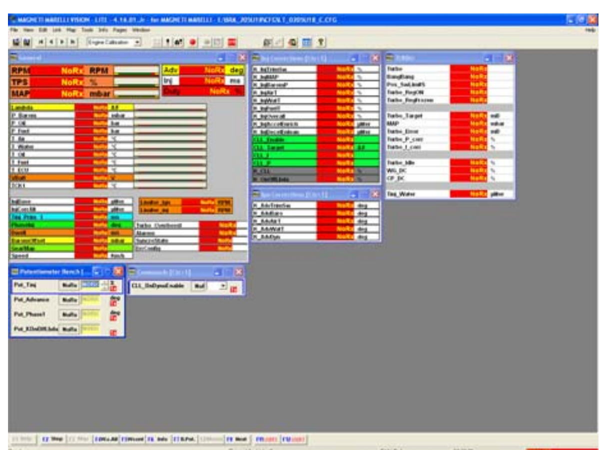
“Open” window appears. Please browse your CD and select “SRA_xxxxxx” folder and then “CFG” folder



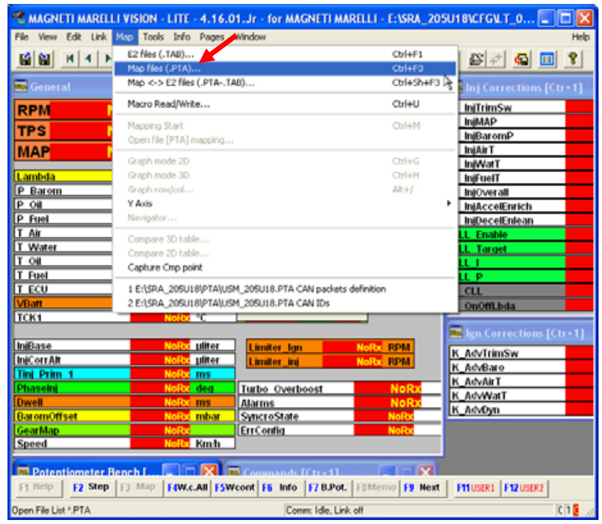
Please select the configuration you want to set and click on “Open” button.



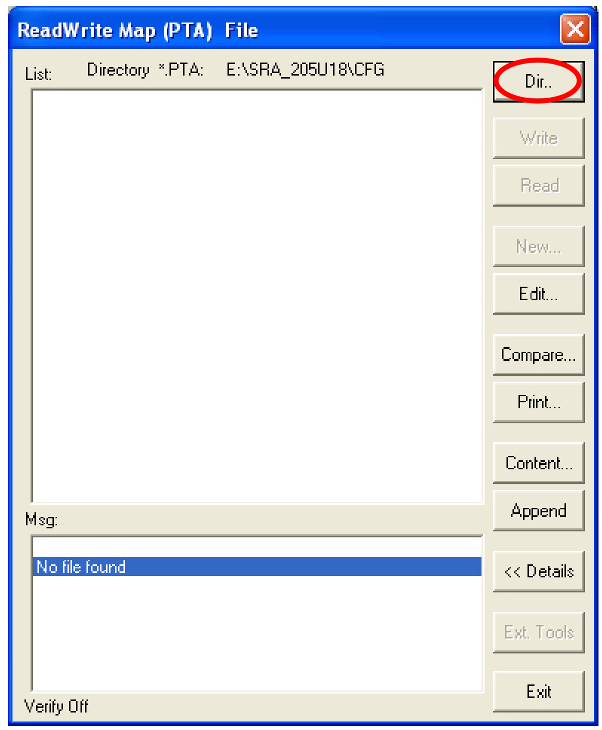
Vision “General” window appears.



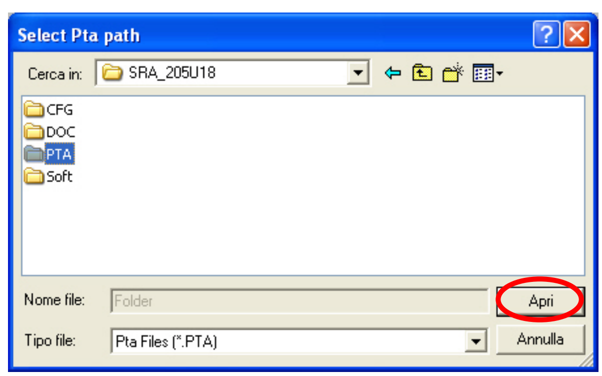
Please click on “Map” button on the top toolbar and then select “Map files(PTA)..” option as in the figure on the right.



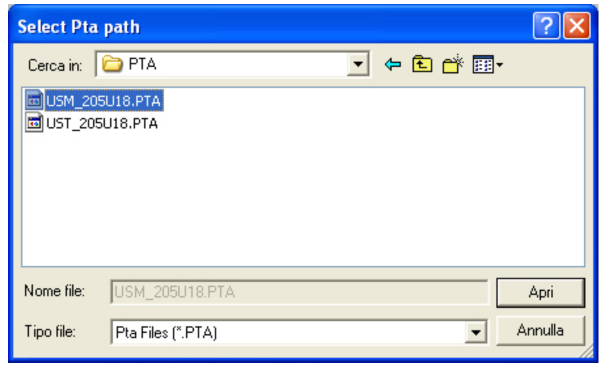
“ReadWrite Map (PTA) File” window appears. Please click on “Dir” button.



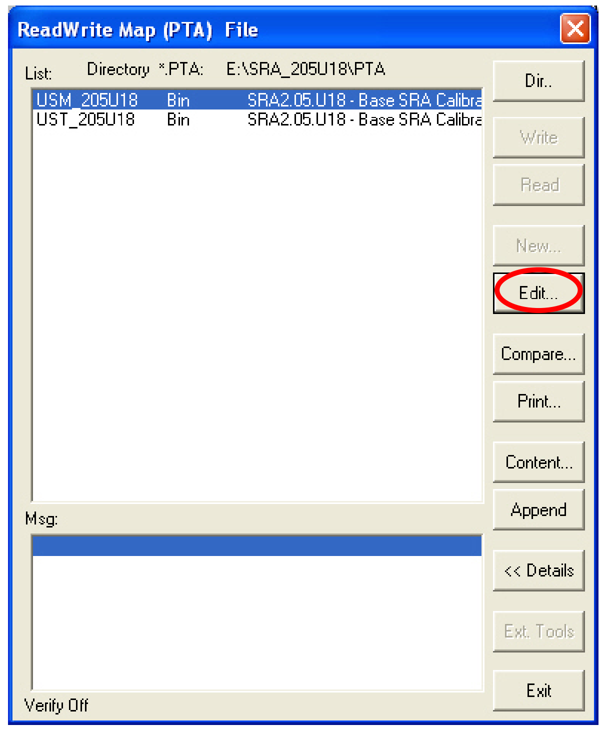
“Select PTA path” window appears. Please select “PTA” folder and click on “Open” button.



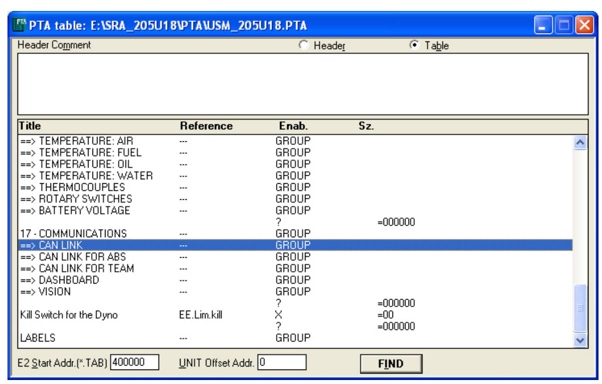
Please select the desired file.



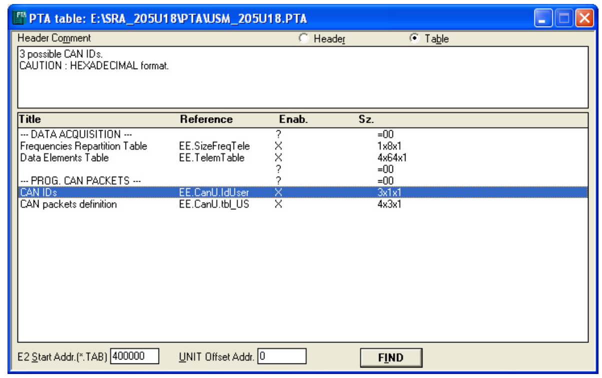
"ReadWrite Map (PTA) File" window appears. Please click on "Edit" button.



"PTA Table" window appears. Please scroll it and select "CAN LINK" option.



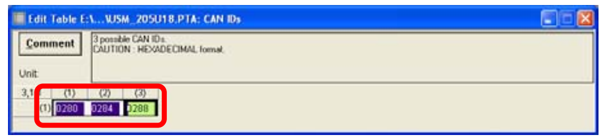
Please double click on “CAN IDs” voice.



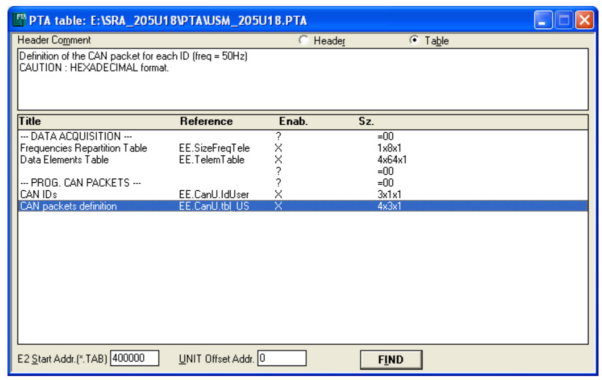
“Edit Table” window appears. Please insert the following values:

- column (1): 280
- column (2): 284
- column (3): 288

and close the window.



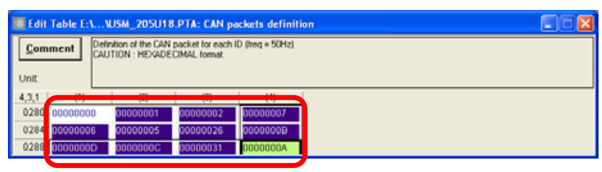
Please double click on “CAN packets definition” voice.



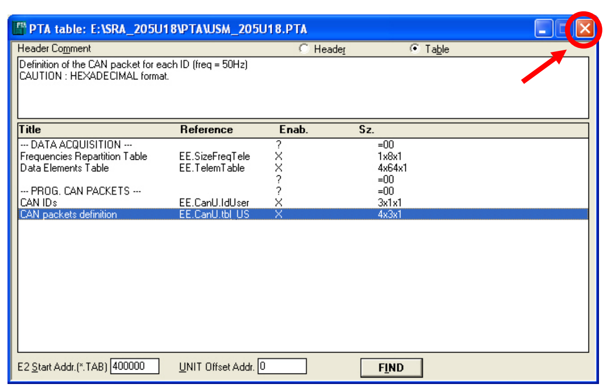
“Edit Table” window appears again. Please insert the following values:

- row 0280: **0, 1, 2, 7**
- row 0284: **6, 5, 26, B**
- row 0288: **D, C, 31, A**

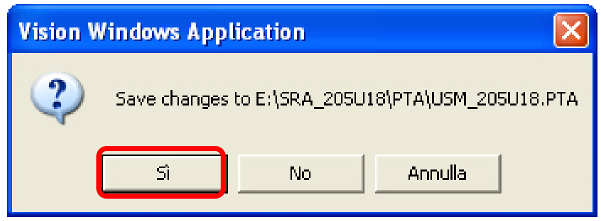
and close the window.



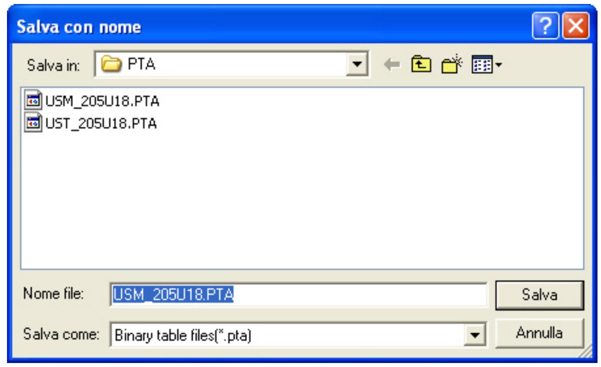
The window on the right appears. Please close it clicking on the red cross on the top right corner.



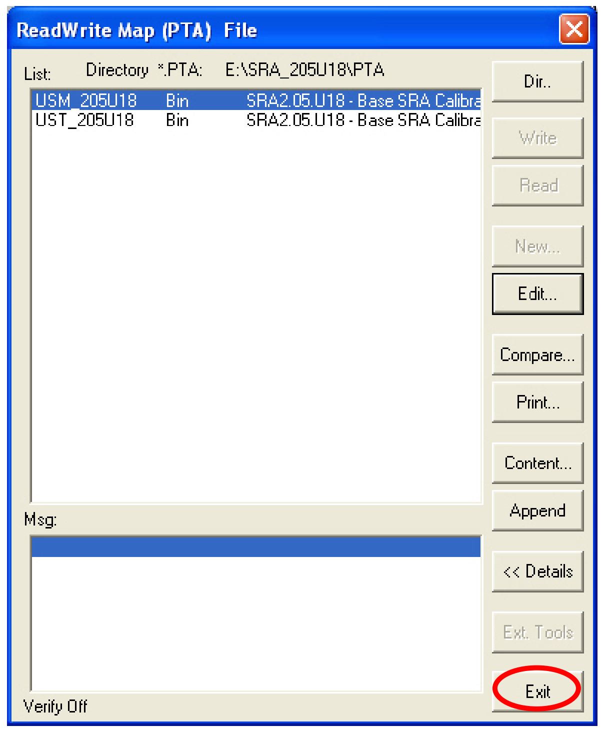
“Vision Application window” appears, asking you to save changes. Please click on “Yes” button.



“Save As” window appears. Please insert file name, select file destination folder and then click on “Save” button.



“ReadWrite Map (PTA) File” appears again. Please click on “Exit” button.



To transmit the configuration to your ECU, please click on “TX” icon, that has become enabled, on the top icons bar.

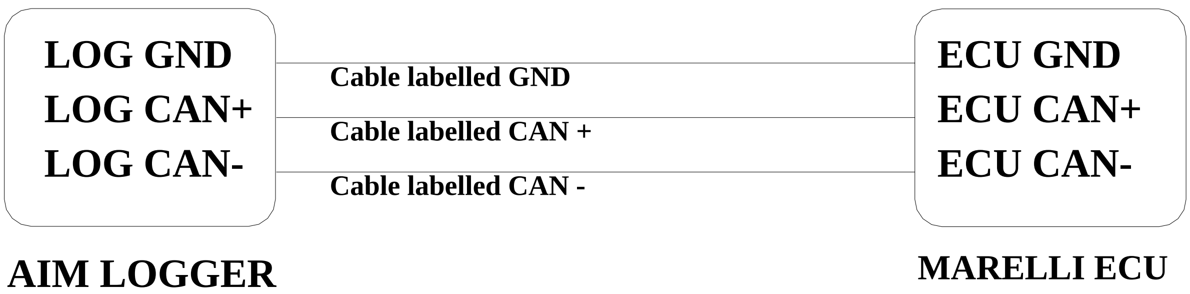


When transmission is finished, please connect your Marelli ECU to your AIM logger following the above reported CAN Communication Set-up

- **CAN Communication Set-Up**

The connection is as follow: please connect cable labelled **CAN+** with **ECU CAN+**, cable labelled **CAN-** with **ECU CAN-** and cable called **GND** with **ECU GND** as in the figure below.

Please refer to your ECU's user's manual to know its pinout.



MARELLI – CUSTOMER PROTOCOL

ECU_1	MAR_RPM	RPM
ECU_2	MAR_THROTTLE	THROTTLE POSITION
ECU_3	MAR_MANIFOLD_PRESSURE	MANIFOLD PRESSURE
ECU_4	MAR_AIR_T	INTAKE AIR TEMPERATURE
ECU_5	MAR_WATER_T	WATER TEMPERATURE
ECU_6	MAR_OIL_P	OIL PRESSURE
ECU_7	MAR_GEAR	ENGAGED GEAR
ECU_8	MAR_BATTERY	BATTERY VOLTAGE
ECU_9	MAR_CONSUMPTION	CONSUMPTION
ECU_10	MAR_KLAMBDA	LAMBDA VALUE
ECU_11	MAR_DIAG	DIAGNOSTIC CHANNEL
ECU_12	MAR_GEAR_POS	ENGAGED GEAR VOLTAGE

"MARELLI – MF4 DUCATI 998 RACING KIT (no stock bike)"

MARELLI – MF4 Ducati 998 Racing Kit (no stock bike)

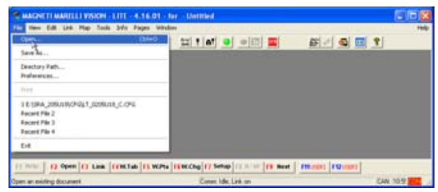
ECU_1	MF4_RPM	RPM
ECU_2	MF4_THROTPOS	THROTTLE POSITION
ECU_3	MF4_WATER_TEMP	WATER TEMPERATURE
ECU_4	MF4_AIR_TEMP	INTAKE AIR TEMPERATURE
ECU_5	MF4_AIR_PRESS_SENSOR	INTAKE AIR PRESSURE

"MARELLI – SRA (complete 64 Channels configuration)"

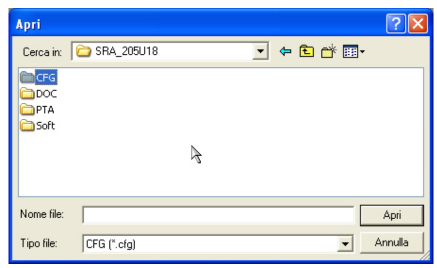
- **ECU Marelli SRA configuration (64 Channels)**,

To configure your ECU Marelli SRA, please follow these steps.

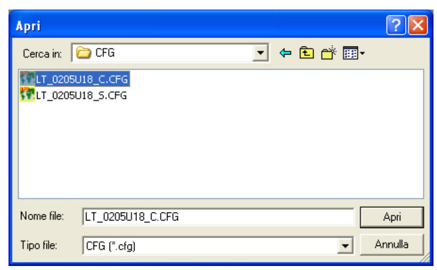
- Launch Vision software.
- Click on File/ Open on the top toolbar as in the figure on the right.



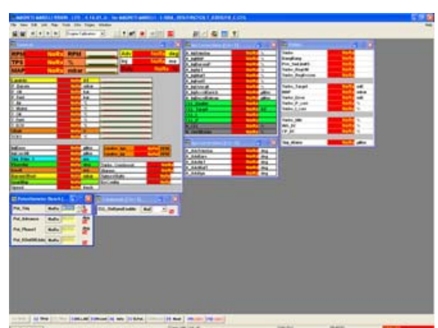
- The following windows appears. Please look for CFG folder and open it, as in the figure on the right.



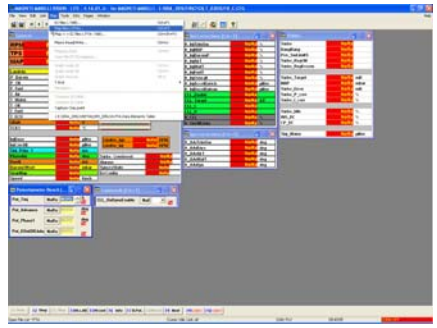
- Select the desired CFG file and open it.



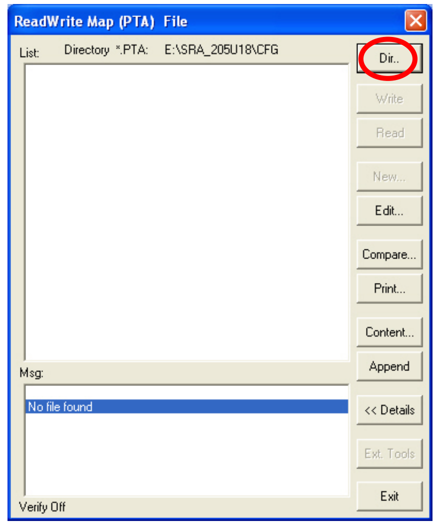
- Click on *"Map"* button on the top toolbar.



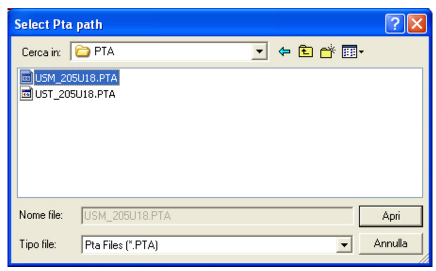
- And select *"Map files"* option.



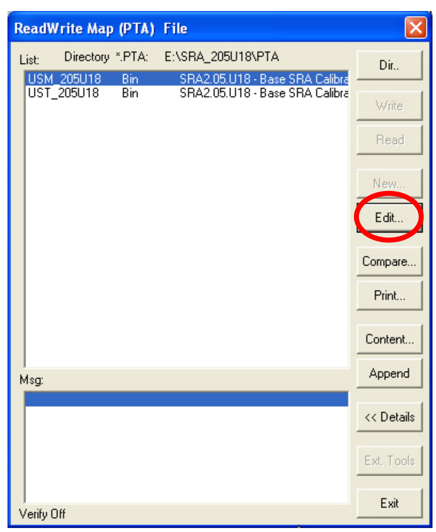
- Click on *"Dir"* button.



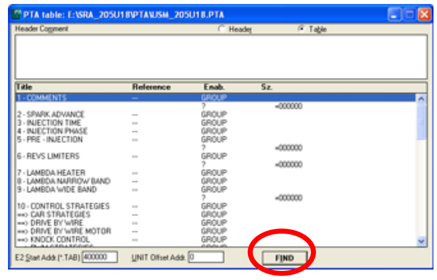
- Select the desired PTA file.



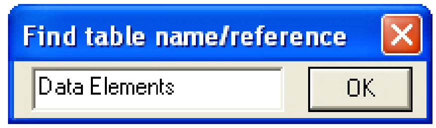
- Click on *"Edit"* button.



- Click on *"Find"* button, red circled in the figure on the right.



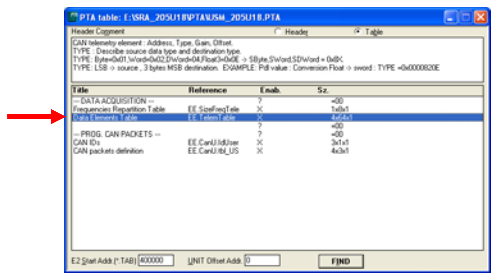
- Digit "Data Elements" and click on *"OK"* button.



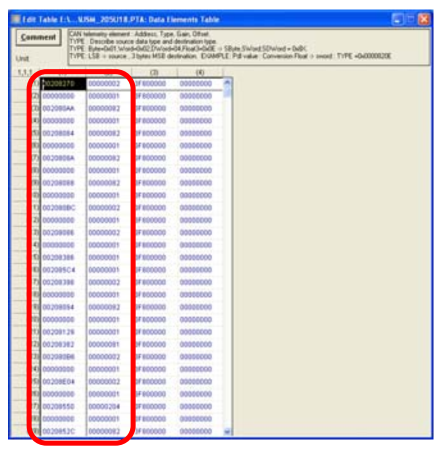
- If find next table name/reference windows appears , please click on *"No"* Button.



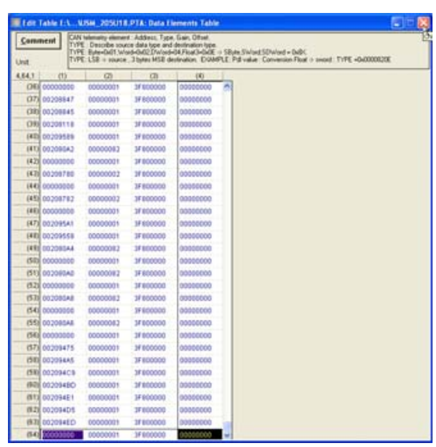
- Double click on "Data Elements Table" option.



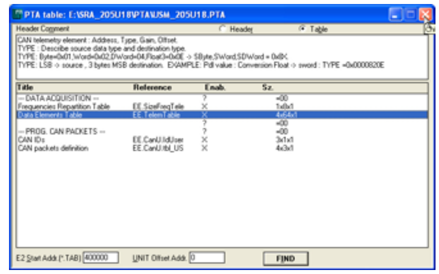
- Please insert in the first two columns on the left of this table all digits reported in the table you find at the end of this explanation (the digits in the other two columns are all right); the table is called ***"Digits Table"***



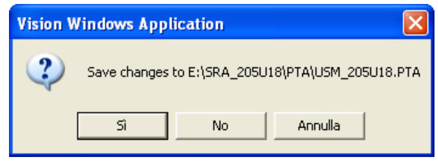
- When all digits have been inserted (you reach row number 64), please close the window.



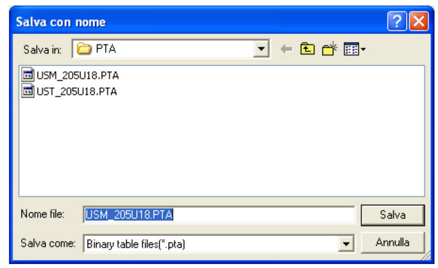
- The window here on the right appears again; please close it.



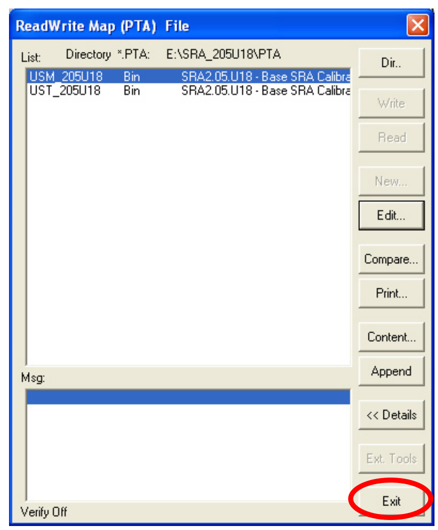
- The system asks you to save changes, please click on *"Yes"* button.



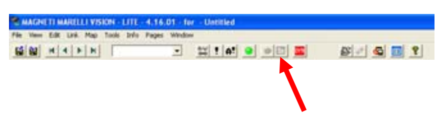
- The system asks you to choose file destination folder; please select the desired one and click on *"Save"* button.



- ReadWrite Map (PTA) file windows appears, please press "Exit" button.



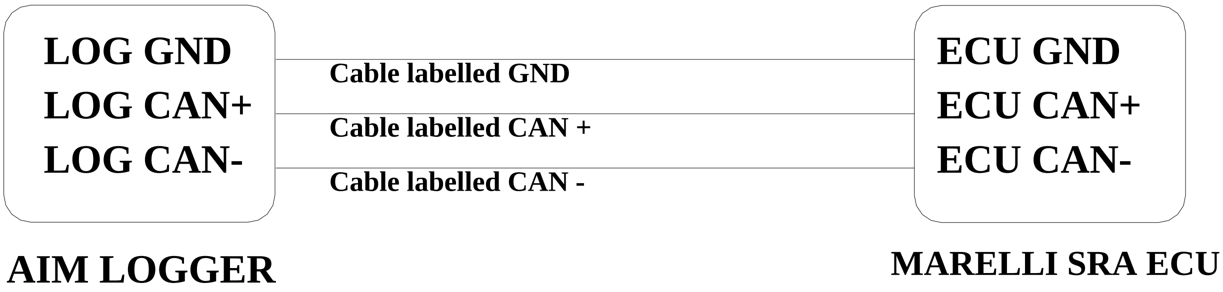
- TX icon, on the top icons toolbar, becomes enabled, please click on it to transmit the configuration to the ECU



When transmission is finished, please connect your Marelli SRA ECU to your AIM logger following the above reported CAN Communication Set-up

- **CAN Communication Set-Up**

The connection is as follow: please connect cable labelled **CAN+** with **ECU CAN+**, cable labelled **CAN-** with **ECU CAN-** and cable called **GND** with **ECU GND** as in the figure below.



Digits Table

	(1)	(2)	(3)	(4)
(1)	00208270	00000002	3F800000	00000000
(2)	00000000	00000001	3F800000	00000000
(3)	00208080	00000082	3F800000	00000000
(4)	00000000	00000001	3F800000	00000000
(5)	0020808C	00000082	3F800000	00000000
(6)	00000000	00000001	3F800000	00000000
(7)	0002080A	00000082	3F800000	00000000
(8)	00000000	00000001	3F800000	00000000
(9)	0020808A	00000082	3F800000	00000000
(10)	00000000	00000001	3F800000	00000000
(11)	002080A8	00000082	3F800000	00000000
(12)	00000000	00000001	3F800000	00000000
(13)	00208088	00000082	3F800000	00000000
(14)	00000000	00000001	3F800000	00000000
(15)	00208086	00000082	3F800000	00000000
(16)	00000000	00000001	3F800000	00000000
(17)	00208084	00000082	3F800000	00000000
(18)	00000000	00000001	3F800000	00000000
(19)	002080A4	00000082	3F800000	00000000
(20)	00000000	00000001	3F800000	00000000
(21)	002080BC	00000002	3F800000	00000000
(22)	00000000	00000001	3F800000	00000000
(23)	00208392	00000082	3F800000	00000000
(24)	00000000	00000001	3F800000	00000000
(25)	00208082	00000082	3F800000	00000000
(26)	00000000	00000001	3F800000	00000000
(27)	0020808E	00000082	3F800000	00000000
(28)	00000000	00000001	3F800000	00000000
(29)	002080AA	00000002	3F800000	00000000
(30)	00000000	00000001	3F800000	00000000
(31)	00208094	00000082	3F800000	00000000
(32)	00000000	00000001	3F800000	00000000
(33)	002080B4	00000002	3F800000	00000000

(34)	00000000	00000001	3F800000	00000000
(35)	002080BA	00000002	3F800000	00000000
(36)	00000000	00000001	3F800000	00000000
(37)	00208E04	00000002	3F800000	00000000
(38)	00000000	00000001	3F800000	00000000
(39)	002080A6	00000082	3F800000	00000000
(40)	00000000	00000001	3F800000	00000000
(41)	00208D25	00000001	3F800000	00000000
(42)	00208D26	00000001	3F800000	00000000
(43)	00208D17	00000001	3F800000	00000000
(44)	00208D18	00000001	3F800000	00000000
(45)	00208846	00000001	3F800000	00000000
(46)	00208845	00000001	3F800000	00000000
(47)	0020883D	00000001	3F800000	00000000
(48)	00208130	00000001	3F800000	00000000
(49)	00208385	00000001	3F800000	00000000
(50)	00208383	00000001	3F800000	00000000
(51)	00208381	00000001	3F800000	00000000
(52)	002085B7	00000001	3F800000	00000000
(53)	002085B8	00000001	3F800000	00000000
(54)	002085B6	00000001	3F800000	00000000
(55)	002085B5	00000001	3F800000	00000000
(56)	00208386	00000001	3F800000	00000000
(57)	002080B0	0000820E	3F800000	00000000
(58)	00000000	00000001	3F800000	00000000
(59)	00208A18	0000820E	3F800000	00000000
(60)	00000000	00000001	3F800000	00000000
(61)	00000000	00000001	3F800000	00000000
(62)	00000000	00000001	3F800000	00000000
(63)	00000000	00000001	3F800000	00000000
(64)	00000000	00000001	3F800000	00000000

MARELLI – SRA

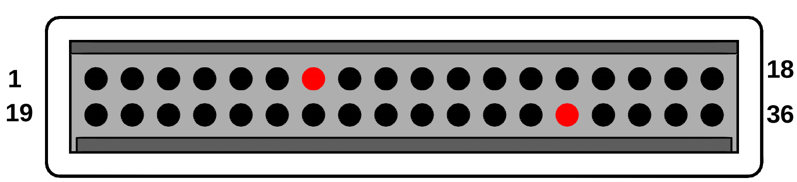
ECU_1	SRA_RPM	RPM
ECU_2	SRA_TPS1	THROTTLE POSITION #1
ECU_3	SRA_PDL1	PEDAL POSITION #1
ECU_4	SRA_WTEMP	WATER TEMPERATURE
ECU_5	SRA_OILP	OIL PRESSURE
ECU_6	SRA_OILT	OIL TEMPERATURE
ECU_7	SRA_FUELP	FUEL PRESSURE
ECU_8	SRA_ATMP	BAROMETRIC PRESSURE
ECU_9	SRA_MAP	MANIFOLD PRESSURE
ECU_10	SRA_AIRT	INTAKE AIR TEMPERATURE
ECU_11	SRA_AFR	AIR/FUEL RATIO
ECU_12	SRA_ADV	SPARK ADVANCE
ECU_13	SRA_TPS2	THROTTLE POSITION #2
ECU_14	SRA_PDL2	PEDAL POSITION #2
ECU_15	SRA_TPS	THROTTLE POSITION
ECU_16	SRA_TCK1	EXHAUST TEMPERATURE #1
ECU_17	SRA_GEAR	ENGAGED GEAR
ECU_18	SRA_LAMBDAMV	LAMBDA VOLTAGE OUTPUT

ECU_19	SRA_SPEED	VEHICLE SPEED
ECU_20	SRA_TFUEL	FUEL TEMPERATURE
ECU_21	SRA_KINGFIL	***NO INFO AVAILABLE YET***
ECU_22	SRA_KTEATFIL	***NO INFO AVAILABLE YET***
ECU_23	SRA_PWM1	PULSE WIDTH MODULATION HEATER #1
ECU_24	SRA_PWM2	PULSE WIDTH MODULATION HEATER #2
ECU_25	SRA_DPV	DUTY CYCLE TURBO COUNTER PRESSURE VALVE
ECU_26	SRA_DWG	DUTY CYCLE TURBO WASTE GATE
ECU_27	SRA_PRLD	ROTARY SWITCH POSITION FOR BANG-BANG START LIMITER
ECU_28	SRA_ITSP	INJECTION TRIM SWITCH POSITION
ECU_29	SRA_ASTP	ADVANCE TRIM SWITCH POSITION
ECU_30	SRA_KAWT	ADVANCE CORRECTION WATER TEMPERATURE
ECU_31	SRA_KABARO	ADVANCE CORRECTION BAROMETRIC PRESSURE
ECU_32	SRA_IKTA	INJECTION CORRECTION AIR TEMPERATURE
ECU_33	SRA_IKTF	INJECTION CORRECTION FUEL TEMPERATURE
ECU_34	SRA_IKBARO	INJECTION CORRECTION BAROMETRIC PRESSURE
ECU_35	SRA_IKADM	***INJECTION CORRECTION PADMISSION
ECU_36	SRA_CLAV	ADVANCE CORRECTION TRIMMER POSITION
ECU_37	SRA_PDL	PEDAL POSITION
ECU_38	SRA_TPSE	THROTTLE POSITION SENSOR

"MBE – 967"

- ## Serial Communication Set-Up

The ECU has a serial communication protocol (RS232) and a 36 pins connector, whose pinout is below, used to communicate with an external logger, or to configure the ECU itself.



Pin	Function	Comments
1	Fuel trim	Mp 06
2	Water temp. signal	
3	Air temp. signal	
4	5v analogue	Mp 04

5	Analogue GND	Mp 05
6	Power GND	Mp 01
7	**POWER GND**	
8	Power GND	
9	Power GND	
10	Gear input	
11	Crank return	
12	Crank signal	
13	ECU supply	
14	Serial receive	Mp 03: RS232 com. – ECU RX
15	Faul light / switch	
16	Shift light	Switched Ground
17	Fuel pump relay drive	Switched Ground
18	Ignition drive 2	Cylinders 2 + 3
19	Power shift input	Ground active
20	Throttle signal	
21	Map signal	
22	5v analogue	
23	Analogue GND	
24	Analogue GND	
25	Oil temperature	
26	Ignition trim	Mp 07
27	Oil pressure	
28	Barom. press./launch input	
29	Lambda signal	
30	Not used	Not used
31	Not used	Not used
32	**SERIAL TRANSMIT**	**Mp 02: RS232 com. – ECU TX**
33	Radiator fan relay drive	Switched Ground
34	Tachometer signal	
35	Injection output	All Cylinders
36	Ignition drive 1	Cylinders 1 + 4 (coil if distributor fitted)

Mp = Mapping plug

To connect the ECU to a PC, using a standard DB9 female connector, **pin 32** (**ECU TX**) of the **ECU** must be connected to **pin 2** of the **DB9** and **pin 7** (or other **Power GND** pins) of the **ECU** must be connected to **pin 5** of the **DB9**.

To communicate with the PC ECU's Fuel Trim (pin 1) and Ignition Trim (pin 26) inputs must be hold at a voltage other than zero; this procedure enables the "Byte Mode" and allows the ECU to communicate with **EasiMap** Windows tool (the MBE configuration program – see ECU manual for more information).

• ECU Configuration

In order to communicate with the data logger, the ECU must be properly configured using the program "**EasiMap**" provided with the same ECU.

PLEASE NOTE: EasiMap v5.0 software can be used to configure data logging feature only by user with "**Advanced**" profile; see MBE site: http://www.mbesystems.com/index.html

1. Connect the ECU to a PC with **EasiMap 5.0** installed, and turn on power to the ECU [ECU pin 13 at 12V and ECU pin 6 (or other **Power GND**) at GND].
2. Launch **EasiMap 5.0** software; choose the [Get Data…] option from the [Data] menu.
3. In the window [Select Parameter] open the [Data Logging] directory and select [Data Logger Link]; choose [ECU Device] in the [Data Source] options and then press [OK].

4. Now the program reads information from the ECU and opens a new window to configure the communication.
5. The parameters must be configured **in the right sequence and with the right scaling** in order to communicate with the AIM data logger:

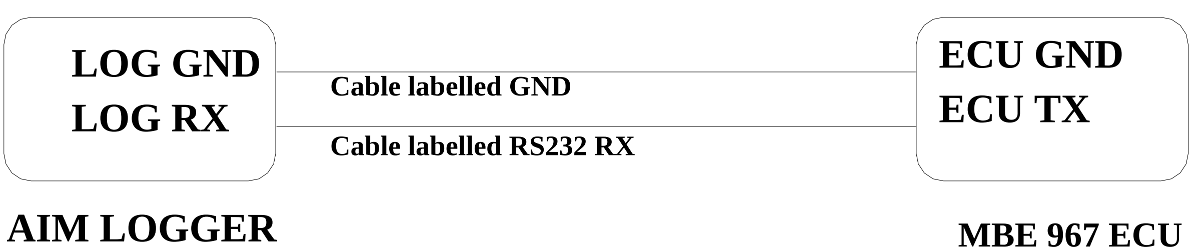
Data Logger Link: choose [**Transmitting at 19200**]
RPM: choose [**4,00**]

Parameter	**Scaling**
1: choose [**Engine Speed**]	Choose 16 bit
2: choose [**Ignition**]	Choose 8 bit
3: choose [**Injection Time**]	Choose 16 bit
4: choose [**Throttle Angle**]	Choose 8 bit
5: choose [**Coolant Temp**]	Choose 8 bit
6: choose [**Air Temp**]	Choose 8 bit
7: choose [**Baro Pressure**]	Choose 8 bit
8: choose [**Lambda**]	Choose 8 bit
9: choose [**Ri**]	Choose 16 bit
10: choose [**Engine Oil Pressure**]	Choose 8 bit
11: choose [**Fuel Pressure**]	Choose 8 bit
12: choose [**Water Pressure**]	Choose 8 bit
13: choose [**Engine Oil Temp**]	Choose 8 bit
14: choose [**Gearbox Oil Temp**]	Choose 8 bit
15: choose [**Boost Pressure**]	Choose 8 bit
16: choose [**Gear Position**]	Choose 8 bit

6. When all parameter are configured, please press [Send] button and choose [ECU Device] when requested; configuration is saved in the ECU memory.
7. Please close configuration window and quit the program. Before connecting ECU to the Data logger, please enable "Broadcast Mode" ensuring a nominally zero voltage (or open circuit) on Fuel Trim and Ignition Trim inputs.

• Connection With AIM Data logger

Connect cable labelled **RS 232 RX** with **pin 32** of the **ECU** (**ECU TX**) and cable labelled **GND** with **pin 7** of the **ECU** (or other **Power GND** pins) as shown in the figure below:



Pin	Function	Comments
7	GND	
32	RS232TX	

MBE – 967

ECU_1	MBE_ENGINESPD	RPM
ECU_2	MBE_IGNITION	SPARK ADVANCE
ECU_3	MBE_INJECTIME	INJECTION TIME
ECU_4	MBE_THROTANG	THROTTLE POSITION
ECU_5	MBE_COOLANTTEMP	WATER TEMPERATURE
ECU_6	MBE_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_7	MBE_BAROPRESS	BAROMETRIC PRESSURE
ECU_8	MBE_LAMBDA	LAMBDA VALUE
ECU_9	MBE_VOLT_LAMBDA	LAMBDA PROBE VOLTAGE
ECU_10	MBE_ENGOILPRESS	OIL PRESSURE
ECU_11	MBE_FUELPRESS	FUEL PRESSURE
ECU_12	MBE_GEAR	ENGAGED GEAR
ECU_13	MBE_GEAROILTEMP	GEARBOX OIL TEMPERATURE
ECU_14	MBE_VOLT_GEAR	GEAR SENSOR VOLTAGE
ECU_15	MBE_BOOSTPRESS	BOOST PRESSURE
ECU_16	MBE_ROW_VAL	THROTTLE BREAK POINT

"MBE – 970"

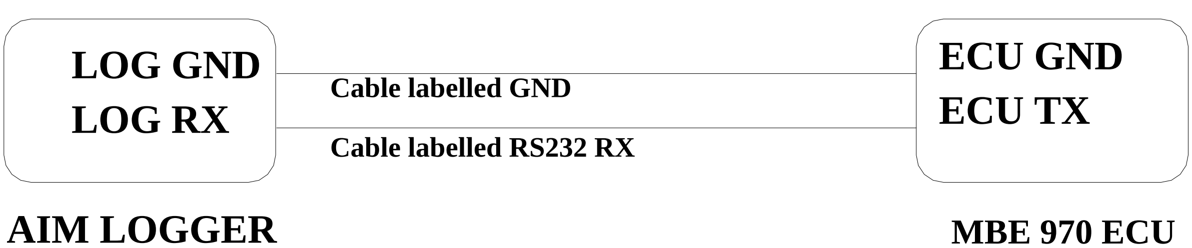
- ### Serial Communication Set-Up

The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.
The pinout for MBE-967 ECU is shown below:

Pin	Function	Comments
50	POWER GND	
46	RS 232 TX	

- ### Connection With AIM Data logger

Connect the cable labelled **RS 232 RX** with **pin 46** of the **ECU** (**ECU TX**), and cable labelled **GND** with **pin 50** of the **ECU** (**ECU GND**) as shown in the figure below:



MBE – 970

ECU_1	MBE_ENGINESPD	RPM
ECU_2	MBE_IGNITION	SPARK ADVANCE
ECU_3	MBE_INJECTIME	INJECTION TIME
ECU_4	MBE_THROTANG	THROTTLE POSITION
ECU_5	MBE_COOLANTTEMP	WATER TEMPERATURE
ECU_6	MBE_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_7	MBE_BAROPRESS	BAROMETRIC PRESSURE
ECU_8	MBE_LAMBDA	LAMBDA VALUE
ECU_9	MBE_VOLT_LAMBDA	LAMBDA PROBE VOLTAGE
ECU_10	MBE_ENGOILPRESS	OIL PRESSURE
ECU_11	MBE_FUELPRESS	FUEL PRESSURE
ECU_12	MBE_GEAR	ENGAGED GEAR
ECU_13	MBE_GEAROILTEMP	GEARBOX OIL TEMPERATURE
ECU_14	MBE_VOLT_GEAR	GEAR SENSOR VOLTAGE
ECU_15	MBE_BOOSTPRESS	BOOST PRESSURE
ECU_16	MBE_ROW_VAL	THROTTLE BREAK POINT

"MBE – 992"

MBE – 992

ECU_1	MBE_ENGINESPD	RPM
ECU_2	MBE_COOLTEMP	WATER TEMPERATURE
ECU_3	MBE_THROTTLEVOLT	THROTTLE VOLTAGE
ECU_4	MBE_THROTANG	THROTTLE POSITION
ECU_5	MBE_BATTVOLT	BATTERY VOLTAGE
ECU_6	MBE_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_7	MBE_GEAR	ENGAGED GEAR
ECU_8	MBE_GEARVOLT	GEAR VOLTAGE
ECU_9	MBE_OIL_P	OIL PRESSURE
ECU_10	MBE_OIL_T	OIL TEMPERATURE
ECU_11	MBE_MAP	MANIFOLD PRESSURE
ECU_12	MBE_BAROPRES	BAROMETRIC PRESSURE
ECU_13	MBE_IGN_A	IGNITION
ECU_14	MBE_IGN_B	IGNITION
ECU_15	MBE_INJT_BANK_A	INJECTION BANK A
ECU_16	MBE_INJT_BANK_B	INJECTION BANK B
ECU_17	MBE_INJT_UPPER_A	
ECU_18	MBE_INJT_UPPER_B	
ECU_19	MBE_WHEEL_SPEED	VEHICLE SPEED
ECU_20	MBE_THROTTLE_SITE	

"MecTronik – MK_E4"

- **MecTronik connection to AIM data logger.**

MecTronik company produces two **MK_E4 ECU** version: the **standard** one and the **drive by wire** one.

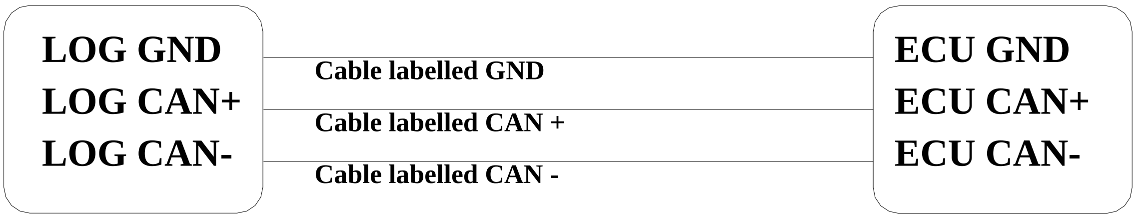
Identification of the two version is possible through the ECU serial number.

- **Standard** version serial numbers are:
  - xx HA xxx
  - xx HB xxx
  - xx HC xxx

- **Drive by Wire** version serial numbers are
  - Xx HD xxx

Where “**HA**” “**HB**” “**HC**” “**HD**” are the codes that identify the ECU version.

Both **MK_E4** ECUs are equipped with a 41 pins connector. To connect Your AIM logger to the ECU, please connect cable labelled **CAN +** with **ECU CAN +** pin, cable called **CAN -** with **ECU CAN -** and cable called **GND** with **ECU GND** as shown in the figure below:



AIM LOGGER **MecTronik MK_E4 ECU**

As far as ECUs pins are concerned, please refer to the following tables to know which pin is to be connected to which cable.

MK_E4 – Standard version (codes: “xx **HA** xxx”, “xx **HB** xxx”, “xx **HC** xxx”)

Pin	Function	Comments
H	ECU GND	
J	CAN +	
Y	CAN -	

MK_E4 – Drive by Wire version (codes: “xx **HD** xxx”)

Pin	Function	Comments
H	ECU GND	
J	CAN +	
c	CAN -	

MECTRONIK – MK_E4

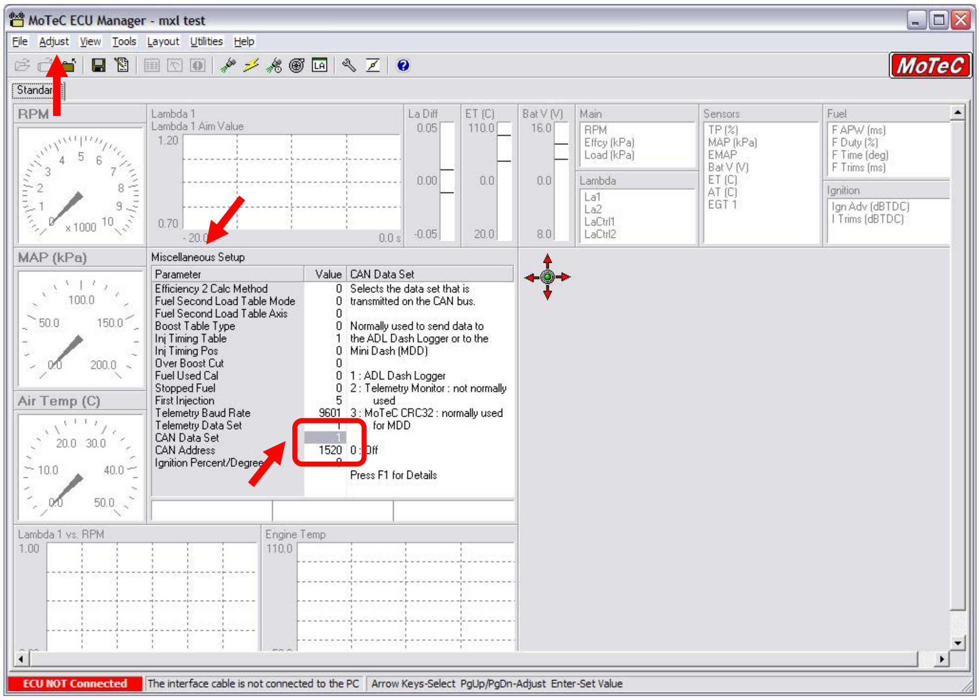
ECU_1	MKE4_RPM	RPM
ECU_2	MKE4_TORQUE	TORQUE VALUE
ECU_3	MKE4_LAMBDA	LAMBDA VALUE
ECU_4	MKE4_KNOCK	DETONATION COUNTER
ECU_5	MKE4_THROTPOS	THROTTLE POSITION
ECU_6	MKE4_ACCPOS	PEDAL POSITION
ECU_7	MKE4_CAMAPOS	CAM SHAFT POSITION #1
ECU_8	MKE4_CAMBPOS	CAM SHAFT POSITION #2
ECU_9	MKE4_TURBOPRESS	BOOST PRESSURE
ECU_10	MKE4_COLLPRESS	MANIFOLD PRESSURE
ECU_11	MKE4_BAROPRESS	BAROMETRIC PRESSURE
ECU_12	MKE4_OILPRESS	OIL PRESSURE
ECU_13	MKE4_ENGTEMP	ENGINE TEMPERATURE
ECU_14	MKE4_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_15	MKE4_OILTEMP	OIL TEMPERATURE

ECU_16	MKE4_AUXTEMP	AUXILIARY TEMPERATURE
ECU_17	MKE4_BATTVOLT	BATTERY VOLTAGE
ECU_18	MKE4_SENSVOLT	SENSOR VOLTAGE
ECU_19	MKE4_AUXAVOLT	AUXILIARY VOLTAGE #1
ECU_20	MKE4_AUXBVOLT	AUXILIARY VOLTAGE #2
ECU_21	MKE4_GEAR	ENGAGED GEAR
ECU_22	MKE4_SPEED	VEHICLE SPEED
ECU_23	MKE4_ENG_CYC	ENGINE CYCLES
ECU_24	MKE4_POWERCUT	
ECU_25	MKE4_RPM2	
ECU_26	MKE4_TORQUE2	
ECU_27	MKE4_LAMBDA2	
ECU_28	MKE4_KNOCK2	
ECU_29	MKE4_THROTPOS2	
ECU_30	MKE4_ACCPOS2	
ECU_31	MKE4_CAMAPOS2	
ECU_32	MKE4_CAMBPOS2	
ECU_33	MKE4_LSUAFR	AIR/FUEL RATIO
ECU_34	MKE4_SNDTEMP	LAMBDA PROBE TEMPERATURE
ECU_35	MKE4_LSUAUXAVOLT	LAMBDA AUX-A VOLTAGE
ECU_36	MKE4_LSUAUXBVOLT	LAMBDA AUX-B VOLTAGE
ECU_37	MKE4_SPEED_FSX	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_38	MKE4_SPEED_FDX	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_39	MKE4_SPEED_RSX	VEHICLE SPEED – REAR LEFT WHEEL
ECU_40	MKE4_SPEED_RDX	VEHICLE SPEED – REAR RIGHT WHEEL
ECU_41	MKE4_ACC_LONG	LONGITUDINAL ACCELERATION
ECU_42	MKE4_ACC_LAT	LATERAL ACCELERATION
ECU_43	MKE4_ROT_XY	
ECU_44	MKE4_STEER	STEERING ANGLE SPEED
ECU_45	MKE4_SLIP_FR	
ECU_46	MKE4_SLIP_LR	
ECU_47	MKE4_SLIP_WHEEL	
ECU_48	MKE4_DIFF_ACC	DIFFERENTIAL ACCELEROMETER
ECU_49	MKE4_REG	
ECU_50	MKE4_IN_STATE	
ECU_51	MKE4_OUT_CURR	
ECU_52	MKE4_PWM	
ECU_53	MKE4_ERR_SEN	
ECU_54	MKE4_ERR_ACT	
ECU_55	MKE4_ERR_TRG	
ECU_56	MKE4_ERR_SENL1	
ECU_57	MKE4_ERR_ACTL1	
ECU_58	MKE4_ERR_SENDC	
ECU_59	MKE4_ERR_ACTDC	

"MoTec – M400 / M600 / M800"

- **MoTeC ECU to AIM CAN Configuration**

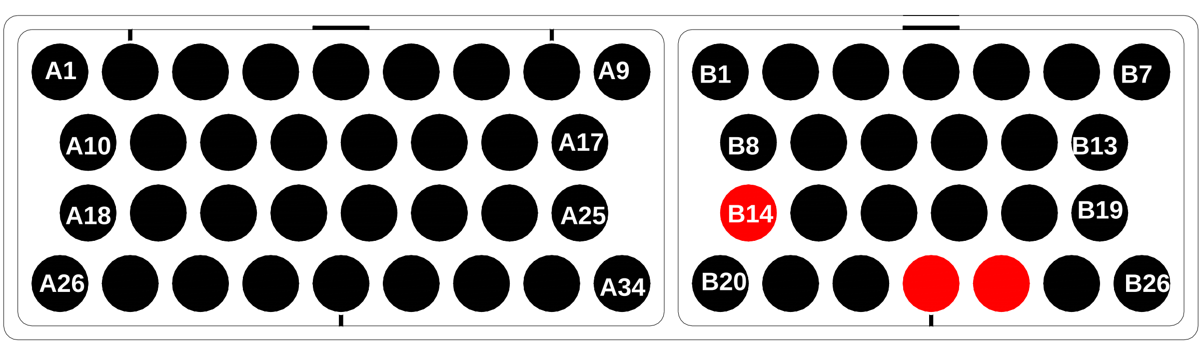
In MoTeC ECU Manager configuration, go to Adjust/General Setup/ Miscellaneous Setup and set the CAN data set to 1 and the CAN Address to 1520 as in the figure below.



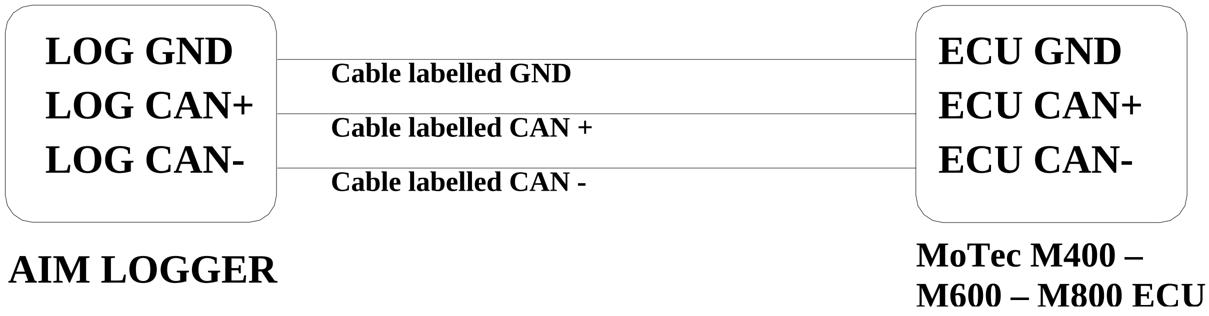
Please note: If the MoTeC CAN communication cable is connected, PC will take CAN priority. AIM logger will not receive data. **After configuration, please ensure that MoTeC communication cable is disconnected.**

- ## Connection With AIM Data logger

The ECU is equipped with a CAN communication interface used to communicate parameters to an external data logger or to configure the ECU itself.
MoTec M800 ECU has two connectors, shown in the figure below. The two connectors are labelled "A" connector and "B" connector.



To connect Your AIM logger to the ECU You need to use connector labelled as "B". Please connect cable labelled **CAN +** with **pin 23** of the **ECU** (**CAN +**), cable labelled **CAN -** with **pin 24** of the **ECU** (**CAN -**) and cable called **GND** with **pin 14** of the ECU as in the figure below:



Pin	Function	Comments
B 14	POWER GND	
B 23	CAN +	
B 24	CAN -	

- **AIM Data logger configuration**

For **ECU with MoTec firmware version 2.30S2 onward**, once you have correctly connected your AIM Logger to the ECU to correctly configure your logger with **Race Studio 2** software, please select the following configuration options.

- **ECU Manufacturer**: **MoTec**
- **ECU Model**: **M800-M600-M400-1M**

MOTEC – M400–M600–M800

ECU_1	M800_RPM	RPM
ECU_2	M800_THROTPOS	THROTTLE POSITION
ECU_3	M800_MANIFPRES	MANIFOLD PRESSURE
ECU_4	M800_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	M800_ENGINE_TEMP	ENGINE TEMPERATURE
ECU_6	M800_LAMBDA1	LAMBDA VALUE #1
ECU_7	M800_LAMBDA2	LAMBDA VALUE #2
ECU_8	M800_EXHAUST_PRESS	EXHAUST PRESSURE
ECU_9	M800_AIR_CHARGE	AIR/FUEL MIX
ECU_10	M800_FUELTEMP	FUEL TEMPERATURE
ECU_11	M800_FUELPRESS	FUEL PRESSURE
ECU_12	M800_OILTEMP	OIL TEMPERATURE
ECU_13	M800_OILPRESS	OIL PRESSURE
ECU_14	M800_GEARVOLT	GEARSHIFT VOLTAGE
ECU_15	M800_KNOCKVOLT	KNOCK SENSOR VOLTAGE
ECU_16	M800_GEARSHIFTFORCE	GEAR SHIFT FORCE
ECU_17	M800_EXHTEMP1	EXHAUST TEMPERATURE#1
ECU_18	M800_EXHTEMP2	EXHAUST TEMPERATURE#2
ECU_19	M800_CHANN1	CUSTOM CHANNEL#1
ECU_20	M800_CHANN2	CUSTOM CHANNEL#2
ECU_21	M800_CHANN3	CUSTOM CHANNEL#3
ECU_22	M800_CHANN4	CUSTOM CHANNEL#4
ECU_23	M800_BATTVOLT	BATTERY VOLTAGE
ECU_24	M800_ECUTEMP	ECU TEMPERATURE

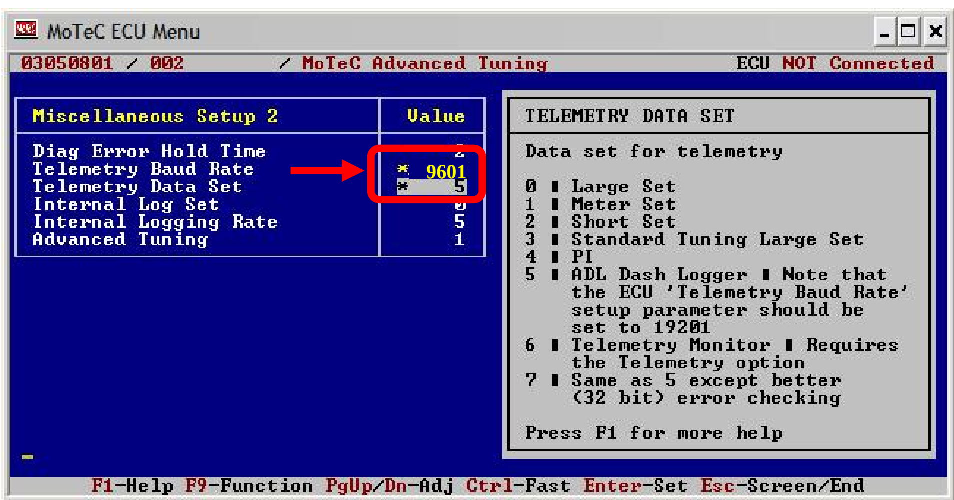
ECU_25	M800_SPEED1	VEHICLE SPEED#1
ECU_26	M800_SPEED2	VEHICLE SPEED#2
ECU_27	M800_SPEED3	VEHICLE SPEED#3
ECU_28	M800_SPEED4	VEHICLE SPEED#4
ECU_29	M800_GROUNDSPEED	GROUND SPEED
ECU_30	M800_DRIVESPEED	DASHBOARD SPEED
ECU_31	M800_SLIP	DRIVEN/DRAGGED SPEED DIFFERENCE
ECU_32	M800_AIMSLIP	TARGET SLIP VALUE
ECU_33	M800_LAUNCHRPM	RPM AT LAUNCH
ECU_34	M800_GEAR	ENGAGED GEAR

"MoTec – M4 "

Please note Motec M4 ECU is supported only from serial number 3000 onwards.

- **MoTeC ECU to AIM RS232 Configuration**

Please run MoTeC configuration Software and press enter button. Then select Adjust function and press enter button. Scroll the page and select General Setup in "Select" window. Then choose Miscellaneous Setup 2.
Set Telemetry Baud Rate to 9601, (9600) and Telemetry Data Set to 5, (ADL Dash Logger).

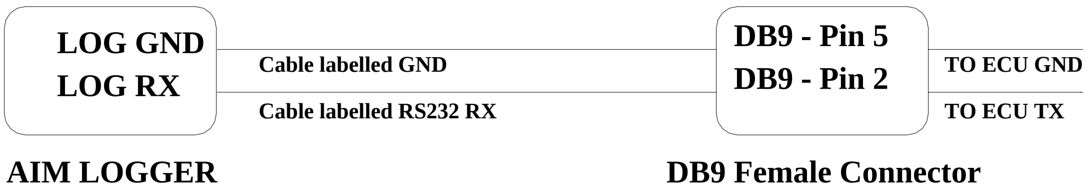


- **MoTeC ECU to AIM RS232 Connection**

Please note: if MoTeC RS-232 communication cable is connected to the ECU and MoTeC software is active, PC takes priority. AIM does not receive data. **Close MoTeC software or make sure that MoTeC software is not active.**

The ECU is equipped with an RS232 communication protocol used to communicate parameters to an external data logger, or to configure the ECU itself.

To connect AIM logger to the ECU you need to use a DB9 female connector. Please connect **Pin 2** of the **DB9 female connector** to AIM cable labelled as “RS232RX” and **Pin 5** of the **DB9 female connector** to AIM cable labelled as “**GND**” as in the draw below:



Pin	Function	Comments
5	GND	
2	RS232RX	

MOTEC – M4-DATA3

ECU_1	M4-M48_RPM	RPM
ECU_2	M4-M48_FUELUSED	FUEL USED
ECU_3	M4-M48_AUXV	AUXILIARY VOLTAGE
ECU_4	M4-M48_AUXT	AUXILIARY TEMPERATURE
ECU_5	M4-M48_MAP	MANIFOLD PRESSURE
ECU_6	M4-M48_TP	THROTTLE POSITION
ECU_7	M4-M48_LA	LAMBDA VALUE
ECU_8	M4-M48_ET	ENGINE TEMPERATURE
ECU_9	M4-M48_AT	INTAKE AIR TEMPERATURE
ECU_10	M4-M48_VB	BATTERY VOLTAGE
ECU_11	M4-M48_ECUTEMP	ECU TEMPERATURE
ECU_12	M4-M48_FAPW	FUEL ACTUAL PULSE WIDTH
ECU_13	M4-M48_FEPW	FUEL EFFECTIVE PULSE WIDTH
ECU_14	M4-M48_FTIME	***NO INFO AVAILABLE YET***
ECU_15	M4-M48_DUTY	DUTY CYCLE
ECU_16	M4-M48_ACCEL	ACCELERATION VALUE
ECU_17	M4-M48_IADV	IGNITION ADVANCE
ECU_18	M4-M48_EPOINT	***NO INFO AVAILABLE YET***
ECU_19	M4-M48_PWM0_DUTY	***NO INFO AVAILABLE YET***
ECU_20	M4-M48_GEAR	ENGAGED GEAR

MOTEC – M4-DATA5

ECU_1	M4_M48_RPM	RPM
ECU_2	M4_M48_THROTPOS	THROTTLE POSITION
ECU_3	M4_M48_MANIFPRES	MANIFOLD PRESSURE
ECU_4	M4_M48_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	M4_M48_ENGINE_TEMP	ENGINE TEMPERATURE

ECU_6	M4_M48_LAMBDA1	LAMBDA VALUE#1
ECU_7	M4_M48_AUXTEMP	AUXILIARY TEMPERATURE
ECU_8	M4_M48_AUXVOLT	AUXILIARY VOLTAGE
ECU_9	M4_M48_BATTVOLT	BATTERY VOLTAGE
ECU_10	M4_M48_ECUTEMP	ECU TEMPERATURE
ECU_11	M4_M48_BAROPRESS	BAROMETRIC PRESSURE
ECU_12	M4_M48_SPEED1	VEHICLE SPEED#1
ECU_13	M4_M48_SPEED2	VEHICLE SPEED#2
ECU_14	M4_M48_GROUNDSPEED	GROUND SPEED
ECU_15	M4_M48_DRIVESPEED	DASHBOARD SPEED
ECU_16	M4_M48_SLIP	DRIVEN/DRAGGED SPEED DIFFERENCE
ECU_17	M4_M48_GEAR	ENGAGED GEAR
ECU_18	M4_M48_LAMBDASHORTTRIM	SHORT TERM FUEL TRIM
ECU_19	M4_M48_LAMBDALONGTRIM	LONG TERM FUEL TRIM

"MoTec – M48"

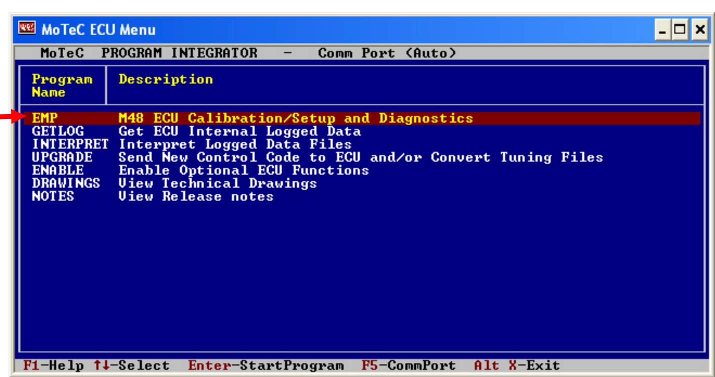
• MoTeC ECU to AIM RS232 Configuration

Motec M-48 ECU can be interfaced to Aim loggers through two different communication protocols based upon two different setups agreed by MoTec firmware.
Motec M 48 needs a MoTec PC connection cable to be interfaced to a Pc; please address to MoTec to know its part number.

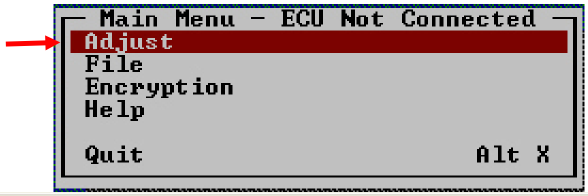
Before connecting Your ECU to AIM loggers, please check its setup; to do so, connect it to the serial port of Your Pc using MoTec ECU Menu V6.20 software you can download free of charge from MoTec website www.motec.com.au.
If when connecting your ECU to the Pc MoTec software recognizes an older version, an upgrade is needed and this is possible through a Software Update Unit, available from most MoTec dealers. Upgrading is automatically done by the software selecting the related voice in MoTec software. If on the contrary, when connecting your ECU to the Pc MoTec software recognizes a corresponding software version, upgrade is not needed.

Once the ECU upgraded (when necessary),please run MoTec software and follow this procedure:.

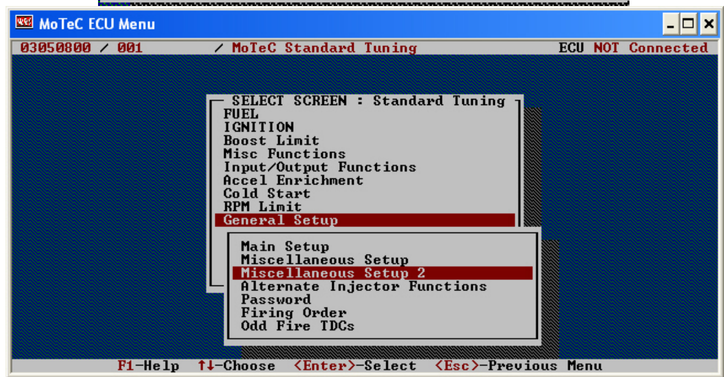
Select EMP (Engine Management Program).



Please select “Adjust”. This way the software acquires ECU setup. If asked, please select the voice “use matching file”



Please select “General Setup” and then Miscellaneous setup 2.



In this setup you can use DataSet5 (the most recent and common) or DataSet3. Here are values corresponding to the two setups.

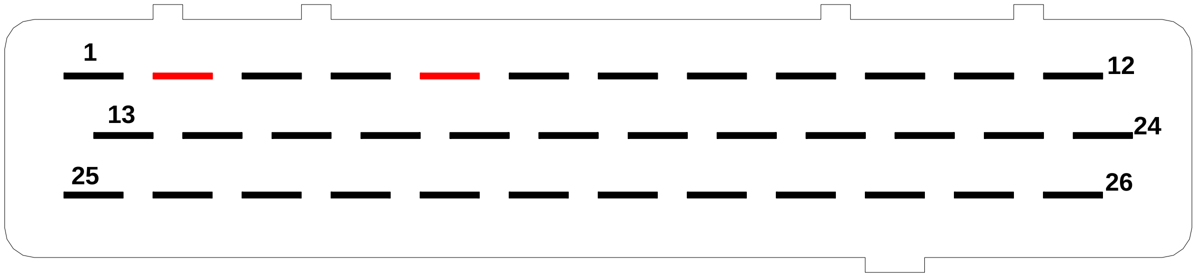
DataSet5		DataSet3	
Diag Error Hold Time	0	Diag Error Hold Time	0
Telemetry Baud Rate	9601	Telemetry Baud Rate	9601
Telemetry DataSet	**5**	**Telemetry DataSet**	**3**
InternalLogSet	0	InternalLogSet	3
InternalLoggingRate	5	InternalLoggingRate	5
Advanced Tuning	1	Advanced Tuning	1

Once entered these values You can save Setup on current file or on a new one. Changes are automatically saved by the software and the ECU is restarted.

• MoTeC ECU to AIM RS232 Connection

Please note: if MoTeC RS-232 communication cable is connected to the ECU and MoTeC software is active, PC takes priority. AIM logger does not receive data. So, please **close MoTeC software or make sure that is not active.**

The ECU is equipped with an RS232 communication protocol used to communicate parameters to an external data logger, or to configure the ECU itself. MoTec M4 ECU has a 36 pin connector, shown in the figure below and needs a DB9 female connector for external communication and of course to communicate to AIM logger too.



Please connect AIM cable labelled “**RS232RX**” to **Pin 2** of the **DB9 female connector** and **Pin 5** of the **DB9 female connector** to AIM cable labelled as “**GND**” as in the draw below:



Pin	Function	Comments
5	GND	
2	RS232RX	

MOTEC – M48-DATA3

ECU_1	M4-M48_RPM	RPM
ECU_2	M4-M48_FUELUSED	FUEL USED
ECU_3	M4-M48_AUXV	AUXILIARY VOLTAGE
ECU_4	M4-M48_AUXT	AUXILIARY TEMPERATURE
ECU_5	M4-M48_MAP	MANIFOLD PRESSURE
ECU_6	M4-M48_TP	THROTTLE POSITION
ECU_7	M4-M48_LA	LAMBDA VALUE
ECU_8	M4-M48_ET	ENGINE TEMPERATURE
ECU_9	M4-M48_AT	INTAKE AIR TEMPERATURE
ECU_10	M4-M48_VB	BATTERY VOLTAGE
ECU_11	M4-M48_ECUTEMP	ECU TEMPERATURE
ECU_12	M4-M48_FAPW	FUEL ACTUAL PULSE WIDTH
ECU_13	M4-M48_FEPW	FUEL EFFECTIVE PULSE WIDTH
ECU_14	M4-M48_FTIME	***NO INFO AVAILABLE YET***
ECU_15	M4-M48_DUTY	DUTY CYCLE
ECU_16	M4-M48_ACCEL	ACCELERATION VALUE
ECU_17	M4-M48_IADV	IGNITION ADVANCE
ECU_18	M4-M48_EPOINT	***NO INFO AVAILABLE YET***
ECU_19	M4-M48_PWM0_DUTY	***NO INFO AVAILABLE YET***
ECU_20	M4-M48_GEAR	ENGAGED GEAR

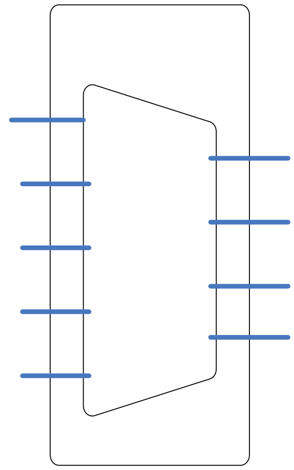
MOTEC – M48-DATA5

ECU_1	M4_M48_RPM	RPM

ECU_2	M4_M48_THROTPOS	THROTTLE POSITION
ECU_3	M4_M48_MANIFPRES	MANIFOLD PRESSURE
ECU_4	M4_M48_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	M4_M48_ENGINE_TEMP	ENGINE TEMPERATURE
ECU_6	M4_M48_LAMBDA1	LAMBDA VALUE #1
ECU_7	M4_M48_AUXTEMP	AUXILIARY TEMPERATURE
ECU_8	M4_M48_AUXVOLT	AUXILIARY VOLTAGE
ECU_9	M4_M48_BATTVOLT	BATTERY VOLTAGE
ECU_10	M4_M48_ECUTEMP	ECU TEMPERATURE
ECU_11	M4_M48_BAROPRESS	BAROMETRIC PRESSURE
ECU_12	M4_M48_SPEED1	VEHICLE SPEED#1
ECU_13	M4_M48_SPEED2	VEHICLE SPEED#2
ECU_14	M4_M48_GROUNDSPEED	GROUND SPEED
ECU_15	M4_M48_DRIVESPEED	DASHBOARD SPEED
ECU_16	M4_M48_SLIP	DRIVEN/DRAGGED SPEED DIFFERENCE
ECU_17	M4_M48_GEAR	ENGAGED GEAR
ECU_18	M4_M48_LAMBDASHORTTRIM	SHORT TERM FUEL TRIM
ECU_19	M4_M48_LAMBDALONGTRIM	LONG TERM FUEL TRIM

"NIRA – I3+"

The communication is done over an RS232 link to NIRA i3+. The baud rate is set to 19200 bit/s. The figure shows the ECU pining.



1 start bit.
1 stop bit.
8 Data bits.
No parity.
19200 baud

NIRA – I3+

ECU_1	NIRA_RPM	RPM
ECU_2	NIRA_WATER_TEMP	WATER TEMPERATURE
ECU_3	NIRA_BATTERY_VOLT	BATTERY VOLTAGE
ECU_4	NIRA_TPS	THROTTLE POSITION
ECU_5	NIRA_MAP	MANIFOLD PRESSURE

ECU_6	NIRA_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_7	NIRA_EXAUST_GAS_TEMP	EXHAUST TEMPERATURE
ECU_8	NIRA_LAMBDA	LAMBDA VALUE
ECU_9	NIRA_AUX1	AUXILIARY CHANNEL#1
ECU_10	NIRA_AUX2	AUXILIARY CHANNEL#2
ECU_11	NIRA_AUX3	AUXILIARY CHANNEL#3
ECU_12	NIRA_AUX4	AUXILIARY CHANNEL#4

"NISSAN – 350Z"

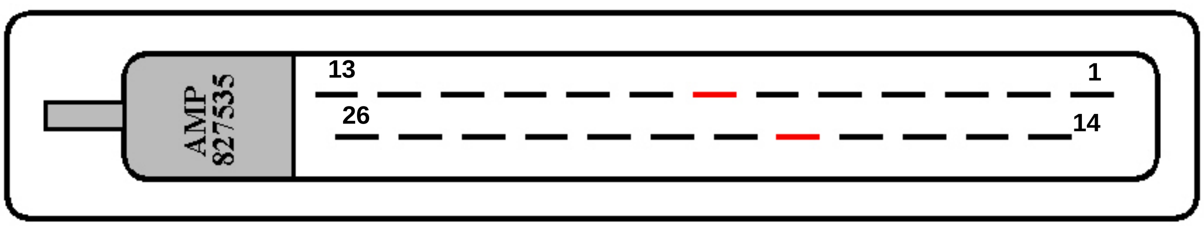
NISSAN – 350Z

ECU_1	NISSAN_RPM	RPM
ECU_2	NISSAN_SPEED	VEHICLE SPEED
ECU_3	NISSAN_PEDAL_POSITION	THROTTLE POSITION
ECU_4	BRAKE_SWITCH	BRAKE SWITCH ON/OFF
ECU_5	ENGINE_COOLANT_TEMP	WATER TEMPERATURE
ECU_6	NISSAN_STEERING_ANGLE	STEERING ANGLE
ECU_7	NISSAN_OIL_PRESS_SWITCH	OIL PRESSURE

"PECTEL – T2"

- **Serial Communication Set-Up**

The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.
The pinout for Pectel T2 ECU is shown below:



Pin	Function	Comments
1	IGN1	Build option: low side / TTL coil driver
14	IGN2	Build option: low side / TTL coil driver
2	INJ1 HIGH IMP	High impedance only
15	INJ2 HIGH IMP	High impedance only
3	INJ3 HIGH IMP	High impedance only
16	INJ4 HIGH IMP	High impedance only
4	PWM1	Low side (10A maximum)
17	PWM2	Low side (10A maximum)

5	ENG GROUND	
18	**ENG GROUND**	
6	12V+ve	
19	RS 232 RX	RS 232 communication – ECU RX
7	**RS 232 TX**	**RS 232 communication – ECU TX**
20	PWM3	Low side (10A maximum)
8	CRANK	Crank sensor input
21	CAM	Cam sensor input
9	MAF/MAP	Analog input
22	TPS	Analog input
10	LAMV	Lambda sensor
23	ECT	Analog input
11	ACT	Analog input
24	SPARE ANALOG	Analog input
12	SENSOR GND	Analog ground
25	5V+ve	200 mA maximum
13	SPARE DIGITAL	Switched input

To connect the ECU to a PC, you need a standard DB9 female connector; please connect pin 7 (**ECU TX**) of the ECU to pin 2 of the DB9 and pin 18 (GND) of the ECU to pin 5 of the DB9.

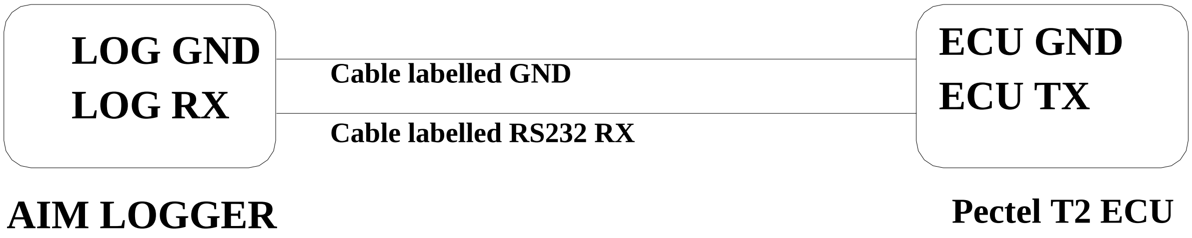
- ## ECU Configuration

The ECU needs an appropriate configuration through the program "**Descpro**", provided by Pectel to communicate with AIM logger. To configure the ECU, please follow these steps:

1. Connect the ECU to a PC with **Descpro** installed, and turn on power to the ECU (ECU pin 6 at 12V and ECU pin 5,18 at GND).
2. Launch **Descpro** software; at start-up mark [**Serial**], choose the right [**COM**] port and click on [**On-line**] button.
3. The software reads the ECU configuration (called "**MAPS"**); when finished, press [**Menu**] button top-right on the screen, and choose [**Software Setup**] in the next window.
4. Now choose [**Data Logging And Serial Comms**] with arrow-keys and press return (or double click with mouse pointer).
5. Select [**Default Communication Mode**] and press return.
6. The default mode should be [**PC**], press return and a dialogue-windows appears (**Set to:**); you must choose [**STACK**] and press return.
7. The new configuration must be transmitted to the ECU before quitting the program: click on [**File**] button (bottom-left) and choose [**Program current maps into ECU flash**]; confirm the operation when prompted.
8. After the transfer is finished quit the program **Decspro**; ECU is ready to communicate with AIM loggers.

- ## Connection With AIM Data logger

Connect cable labelled **RS 232 RX** with **pin 7** of the **ECU** (**ECU TX**), and cable labelled **GND** with **pin18** of the **ECU** (**ECU GND**) as shown in the figure below:



Pin	Function	Comments
18	GND	
7	RS232TX	

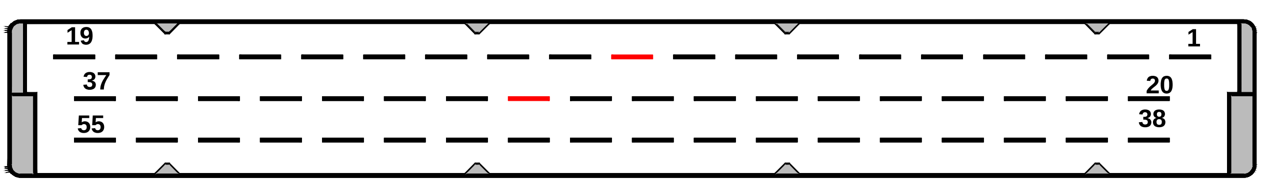
PECTEL – T2

ECU_1	PECTEL_RPM	RPM
ECU_2	PECTEL_WHEELSPD	VEHICLE SPEED
ECU_3	PECTEL_OILPRESS	OIL PRESSURE
ECU_4	PECTEL_OILTEMP	OIL TEMPERATURE
ECU_5	PECTEL_WATERTEMP	WATER TEMPERATURE
ECU_6	PECTEL_FUELPRESS	FUEL PRESSURE
ECU_7	PECTEL_BATTVOLT	BATTERY VOLTAGE
ECU_8	PECTEL_THROTANG	THROTTLE POSITION
ECU_9	PECTEL_MANIFPRESS	MANIFOLD PRESSURE
ECU_10	PECTEL_AIRCHARGETEMP	INTAKE AIR TEMPERATURE
ECU_11	PECTEL_EXHTEMP	EXHAUST TEMPERATURE
ECU_12	PECTEL_LAMBDA	LAMBDA VALUE
ECU_13	PECTEL_FUELTEMP	FUEL TEMPERATURE
ECU_14	PECTEL_GEAR	ENGAGED GEAR

"PECTEL – T6"

- **Serial Communication Set-Up**

The ECU is equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECU itself.
Pectel T2 ECU has a 55 pins AMP connector shown below:



Pin	Function	Comments
1	SW2	Switch input. Internal 22k Pullup
20	SW1	Switch input. Internal 22k Pullup
38	LAMI2	Lambda Sensor 2
2	LAMV2	Lambda Sensor 2
21	PWM6/DET2	Build Option. Knock Sensor 2 or Low side drive
39	LAMI1	Lambda Sensor 1
3	LAMV1	Lambda Sensor 1
22	5V SENSOR SUPPLY	200mA maximum
40	Sensor GND	
4	SP2(AN8)	Analog input. Software Select Input Type
23	SP1(AN7)	Analog input. Software Select Input Type
41	MAP (AN6)	Analog input. Software Select Input Type
5	TPS(AN5)	Analog input. Software Select Input Type
24	SP4(AN4)	Analog input. Software Select Input Type
42	SP3(AN3)	Analog input. Software Select Input Type
6	ECT(AN2)	Analog input. Software Select Input Type
25	ACT(AN1)	Analog input. Software Select Input Type
43	ROT4	Digital input. Software Select 10k Pullup
7	THERMOSIG	K Type thermocouple input
26	ROT3	Digital input. Software Select 10k Pullup
44	ROT2	Digital input. Software Select 10k Pullup
8	ROT1	Digital input. Software Select 10k Pullup
27	DET1	Knock Sensor 1
45	PWM5	Low Side Drive
9	CAMSIG	CAM sensor
28	CRANKSIG	Crank sensor
46	COMMSGND	Comms ground
10	**RS232TX**	**RS232 comms**
29	RS232RX	RS232 comms
47	CAN LOW	CAN communications
11	CAN HIGH	CAN communications
30	**ENGGND**	
48	ENGGND	
12	ENGGND	
31	12V ECU SUPPLY	
49	PWM4	Low Side Drive (10A maximum)
13	PWM3	Low Side Drive (10A maximum)
32	PWM2	Low Side Drive (10A maximum)
50	PWM1	Low Side Drive (10A maximum)
14	INJ12/IGN8/PWM10	Build Option–Injector drive/Ignition/Low Side Drive (10A max.)
33	INJ11/IGN7/PWM9	Build Option–Injector drive/Ignition/Low Side Drive (10A max.)
51	INJ10/IGN6/PWM8	Build Option–Injector drive/Ignition/Low Side Drive (10A max.)
15	INJ9/IGN5/PWM7	Build Option–Injector drive/Ignition/Low Side Drive (10A max.)
34	INJ8	Software Select Low/High impedance injector drive (10A max)
52	INJ7	Software Select Low/High impedance injector drive
16	INJ6	Software Select Low/High impedance injector drive
35	INJ5	Software Select Low/High impedance injector drive
53	INJ4	Software Select Low/High impedance injector drive
17	INJ3	Software Select Low/High impedance injector drive
36	INJ2	Software Select Low/High impedance injector drive

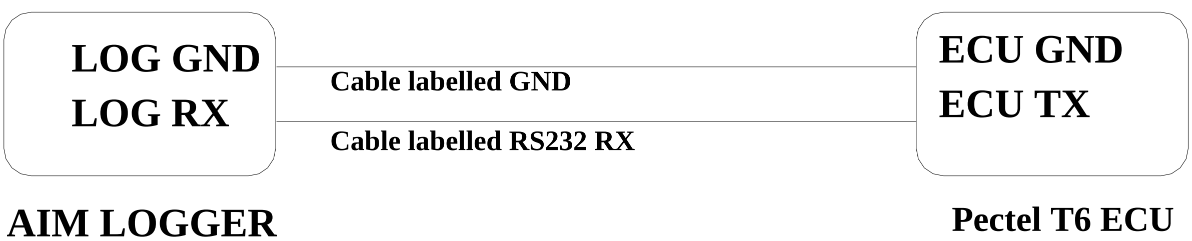
24	INJ1	Software Select Low/High impedance injector drive
18	IGN4	Build Option: Low Side/TTL Coil Drive
37	IGN3	Build Option: Low Side/TTL Coil Drive
55	IGN2	Build Option: Low Side/TTL Coil Drive
19	IGN1	Build Option: Low Side/TTL Coil Drive

- **ECU Configuration**

1. To connect the ECU to a PC, you need to use a standard DB9 female connector; please connect **pin 10** (**ECU TX**) of the ECU to **pin 2** of the DB9 and **pin 30** (**GND**) of the ECU to **pin 5** of the DB9
2. The ECU must be properly configured using the program "**Descpro**" provided by Pectel to communicate with the data logger. Suggested configuration is the same of Pectel T2 ECU. Please note: pins used to power Pectel T6 are: pin 31 12V and pins 30, 48 or 12 for GND.

- **Connection With AIM Data logger**

Connect cable labelled **RS 232 RX** with **pin 10** of the ECU (**ECU TX**), and cable called **GND** with **pin 30** of the ECU (**ECU GND**) as shown in the figure below:



PECTEL – T_2/T_6

ECU_1	PECTEL_RPM	RPM
ECU_2	PECTEL_WHEELSPD	VEHICLE SPEED
ECU_3	PECTEL_OILPRESS	OIL PRESSURE
ECU_4	PECTEL_OILTEMP	OIL TEMPERATURE
ECU_5	PECTEL_WATERTEMP	WATER TEMPERATURE
ECU_6	PECTEL_FUELPRESS	FUEL PRESSURE
ECU_7	PECTEL_BATTVOLT	BATTERY VOLTAGE
ECU_8	PECTEL_THROTANG	THROTTLE POSITION
ECU_9	PECTEL_MANIFPRESS	MANIFOLD PRESSURE
ECU_10	PECTEL_AIRCHARGETEMP	INTAKE AIR TEMPERATURE
ECU_11	PECTEL_EXHTEMP	EXHAUST TEMPERATURE
ECU_12	PECTEL_LAMBDA	LAMBDA VALUE
ECU_13	PECTEL_FUELTEMP	FUEL TEMPERATURE
ECU_14	PECTEL_GEAR	ENGAGED GEAR

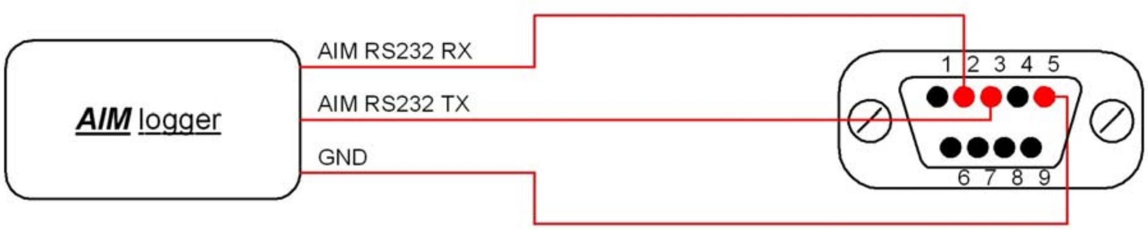
"PERFORMANCE ELECTRONICS – PE-ECU1"

The ECUs are equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECUs themselves.

- **Connection With AIM Data logger**

AIM loggers can be connected to PERFORMANCE ELECTRONICS ECUs via DB9 serial port according to the following wiring scheme:

- Connect the AIM cable labeled "RS 232 RX" with DB9 male Pin 2
- Connect the AIM cable labeled "RS 232 TX" with DB9 male Pin 3



PERFORMANCE ELECTRONICS – PE-ECU1

ECU_1	PERF_RPM	RPM
ECU_2	PERF_TPS	THROTTLE POSITION
ECU_3	PERF_MAP	MANIFOLD PRESSURE
ECU_4	PERF_IAT	INTAKE AIR TEMPERATURE
ECU_5	PERF_ECT	WATER TEMPERATURE

"RACETECH – EM_36"

RACETECH – EM_36

ECU_1	RACETECH_RPM	RPM
ECU_2	RACETECH_THROTTLE	THROTTLE POSITION
ECU_3	RACETECH_BAROPRES	BAROMETRIC PRESSURE
ECU_4	RACETECH_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	RACETECH_WATERTEMP	WATER TEMPERATURE
ECU_6	RACETECH_BATTERY	BATTERY VOLTAGE
ECU_7	RACETECH_LAMBDA	LAMBDA VALUE
ECU_8	RACETECH_INJECTIME	INJECTION TIME
ECU_9	RACETECH_IGNITADV	IGNITION ADVANCE

"RACETECH – EM_46"

RACETECH – EM_46

ECU_1	RACETECH_RPM	RPM
ECU_2	RACETECH_THROTTLE	THROTTLE POSITION
ECU_3	RACETECH_BAROPRES	BAROMETRIC PRESSURE
ECU_4	RACETECH_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	RACETECH_WATERTEMP	WATER TEMPERATURE
ECU_6	RACETECH_BATTERY	BATTERY VOLTAGE
ECU_7	RACETECH_LAMBDA	LAMBDA VALUE
ECU_8	RACETECH_INJECTIME	INJECTION TIME
ECU_9	RACETECH_IGNITADV	IGNITION ADVANCE

"RACETECH – ENGMAN18"

RACETECH – ENGMAN_18

ECU_1	RACETECH_RPM	RPM
ECU_2	RACETECH_THROTTLE	THROTTLE POSITION
ECU_3	RACETECH_BAROPRES	BAROMETRIC PRESSURE
ECU_4	RACETECH_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_5	RACETECH_WATERTEMP	WATER TEMPERATURE
ECU_6	RACETECH_IGNITADV	IGNITION ADVANCE
ECU_7	RACETECH_INJECTIME	INJECTION TIME
ECU_8	RACETECH_BATTERY	BATTERY VOLTAGE
ECU_9	RACETECH_LAMBDA	LAMBDA VALUE

"SEAT – ECU1"

SEAT – ECU_1

ECU_1	SEAT_RPM	RPM
ECU_2	SEAT_SPEED1	VEHICLE SPEED#1
ECU_3	SEAT_WATERTEMP	WATER TEMPERATURE
ECU_4	SEAT_ENGINEMOMENT	TORQUE VALUE
ECU_5	SEAT_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_6	SEAT_GASPERC	***NO INFO AVAILABLE YET***
ECU_7	SEAT_BRAKEPRESS	BRAKE PRESSURE

ECU_8	SEAT_SPEED2	VEHICLE SPEED#2
ECU_9	SEAT_SPEEDDASH	DASHBOARD SPEED
ECU_10	SEAT_ACCLAT	LATERAL ACCELERATION
ECU_11	SEAT_STEERMOMENT	STEERING COLUMN MOMENT
ECU_12	SEAT_ATMTEMP	BAROMETRIC TEMPERATURE
ECU_13	SEAT_OILTEMP	OIL TEMPERATURE
ECU_14	SEAT_FRLF_SPEED	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_15	SEAT_FRRG_SPEED	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_16	SEAT_RRLF_SPEED	VEHICLE SPEED – REAR LEFT WHEEL
ECU_17	SEAT_RRRG_SPEED	VEHICLE SPEED – REAR RIGHT WHEEL
ECU_18	SEAT_YAWRATE	YAWRATE
ECU_19	SEAT_STEERSPEED	STEERING ANGULAR RATE
ECU_20	SEAT_STEERANGLE	STEERING ANGLE
ECU_21	SEAT_BRAKE	BRAKE SWITCH ON/OFF

"SODEMO – EV11"

SODEMO – EV_11

ECU_1	EV11_REGMOT	RPM
ECU_2	EV11_POTPAP	
ECU_3	EV11_PCOLL	
ECU_4	EV11_RICHESSE	
ECU_5	EV11_AIRTEMP	INTAKE AIR TEMPERATURE
ECU_6	EV11_EXHAUSTTEMP	EXHAUST TEMPERATURE
ECU_7	EV11_ACCPOS	
ECU_8	EV11_SPEED_FRONTSX	VEHICLE SPEED – FRONT LEFT WHEEL
ECU_9	EV11_ SPEED_FRONTDX	VEHICLE SPEED – FRONT RIGHT WHEEL
ECU_10	EV11_ SPEED_REARSX	VEHICLE SPEED – REAR LEFT WHEEL
ECU_11	EV11_ SPEED_REARDX	VEHICLE SPEED – REAR RIGHT WHEEL
ECU_12	EV11_TURBOSPD1	
ECU_13	EV11_TURBOSPD2	
ECU_14	EV11_ADAVANCE	
ECU_15	EV11_INJECTIME	INJECTION TIME
ECU_16	EV11_ROC1	
ECU_17	EV11_WATERTEMP	WATER TEMPERATURE
ECU_18	EV11_WATERTEMP2	WATER TEMPERATURE#2
ECU_19	EV11_FUELTEMP	FUEL TEMPERATURE
ECU_20	EV11_OILTEMP	OIL TEMPERATURE
ECU_21	EV11_GEAR	ENGAGED GEAR
ECU_22	EV11_TOTKM	COVERED DISTANCE (KM)
ECU_23	EV11_DOWNFLAG	
ECU_24	EV11_DOWNFLAG2	
ECU_25	EV11_ATMPRESS	BAROMETRIC PRESSURE
ECU_26	EV11_VPOTVB	
ECU_27	EV11_FUELPRESS	FUEL PRESSURE
ECU_28	EV11_OILPRESS	OIL PRESSURE
ECU_29	EV11_PCOLL2	
ECU_30	EV11_RICHESSE2	
ECU_31	EV11_AIRTEMP2	INTAKE AIR TEMPERATURE#2
ECU_32	EV11_EXHAUSTTEMP2	EXHAUST TEMPERATURE#2

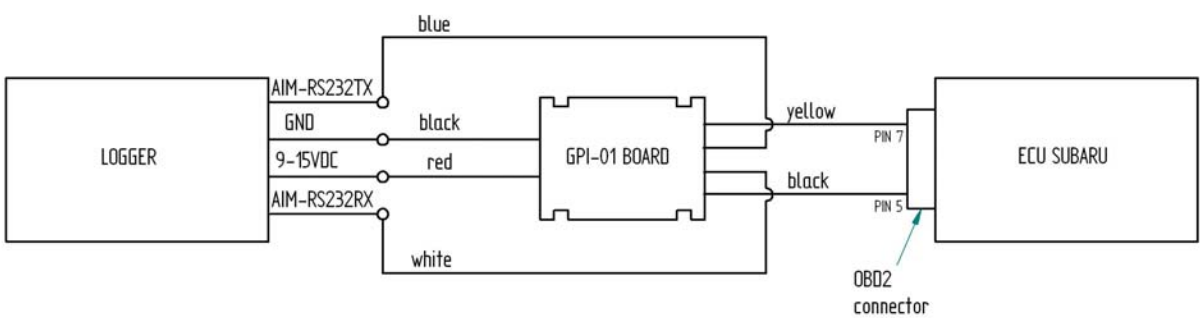
ECU_33	EV11_BATTVOLT	BATTERY VOLTAGE
ECU_34	EV11_FUEL	
ECU_35	EV11_INJECTIME2	
ECU_36	EV11_ROC2	
ECU_37	EV11_PHASEFLAG	
ECU_38	EV11_FUELBURNED	FUEL USED
ECU_39	EV11_CORRECTIONFLAG	
ECU_40	EV11_LIBRE	

"SUBARU – SSM"

This paragraph applies to all Subaru vehicles supporting the SSM (Subaru Select Monitor) with OBD2 connector (from 1999 to 2007). The number of supported channels may vary and depends on car model and year of production.

- **Connection With AIM Data logger**

In order to connect the datalogger to the SUBARU SSM ECU, you need to connect the AIM GPI01 interface between the AIM system and the ECU as shown below.



SUBARU - SSM

ECU_1	SUBARU_RPM	RPM
ECU_2	SUBARU_SPEED	VEHICLE SPEED
ECU_3	SUBARU_THROTPOS	THROTTLE POSITION
ECU_4	SUBARU_TENGINE	COOLANT TEMPERATURE
ECU_5	SUBARU_MAP	MANIFOLD PRESSURE
ECU_6	SUBARU_IN_ADVANCE_R	

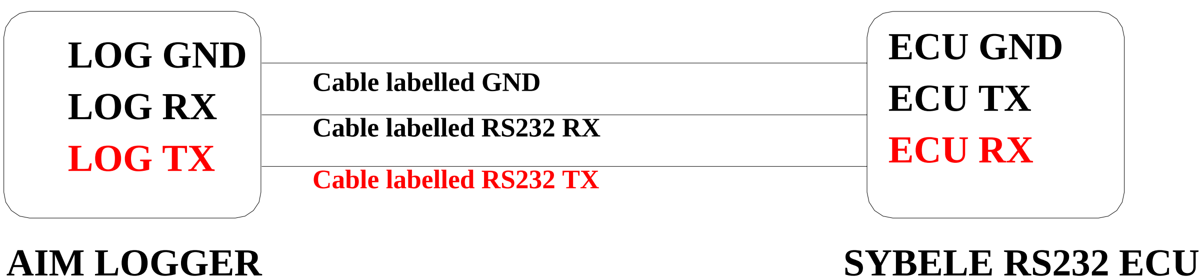
ECU_7	SUBARU_IN_ADVANCE_L	
ECU_8	SUBARU_IGNITION_TIMING	IGNITION TIME
ECU_9	SUBARU_KNOCK_CORR	KNOCK ANGLE CORRECTION
ECU_10	SUBARU_FUEL_LEV	FUEL LEVEL
ECU_11	SUBARU_NEUTRAL	NEUTRAL SIGNAL
ECU_12	SUBARU_CLUTCH	CLUTCH SWITCH ON/OFF
ECU_13	SUBARU_BRAKE	BRAKE SWITCH ON/OFF
ECU_14	SUBARU_ENGINE_LOAD	ENGINE LOAD
ECU_15	SUBARU_AIR_FLOW	INTAKE AIR PRESSURE

"SYBELE – RS232"

Sybele RS232 ECU is equipped with a 35 pins male connector (shown below) used to communicate with an external data logger and to configure the ECU itself.

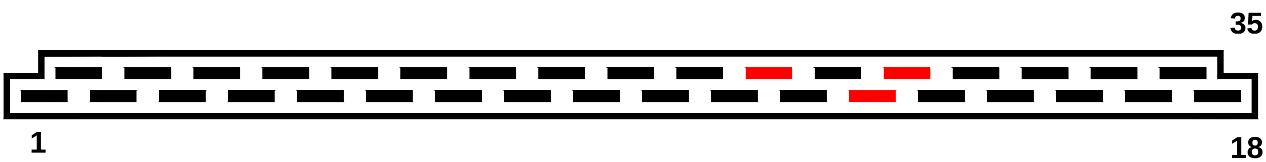
- **Connection With AIM Data logger**

Connect cable labelled **RS 232 RX** with **ECU TX** (**pin 13** of the 35 pins male connector), cable called **RS 232 TX** with **ECU RX** (**pin 31** of the 35 pins male connector) and cable called **GND** with **ECU Power GND** (pin 29 of the 35 pins male connector) as shown in the figure below.



Please note: this ECU needs connection of **LOG TX** cable to **ECU RX** pin too.

Here below you can see Sybele RS232 35 pins male connector and its pinout.



PIN	Function	Comments
31	RS232RX	
13	RS232TX	
29	GND	

SYBELE – RS232

ECU_1	SYBELE_RPM	RPM
ECU_2	SYBELE_TPS	THROTTLE POSITION
ECU_3	SYBELE_MAP	MANIFOLD PRESSURE
ECU_4	SYBELE_VBATT	BATTERY VOLTAGE
ECU_5	SYBELE_AFR	AIR/FUEL RATIO
ECU_6	SYBELE_ENGTEMP	ENGINE TEMPERATURE
ECU_7	SYBELE_AIRT	INTAKE AIR TEMPERATURE
ECU_8	SYBELE_ATMPRESS	BAROMETRIC PRESSURE
ECU_9	SYBELE_GEAR	ENGAGED GEAR
ECU_10	SYBELE_INJTIME	INJECTION TIME
ECU_11	SYBELE_ADVANTAGE	SPARK ADVANCE
ECU_12	SYBELE_COEXCORLAMBDA	LAMBDA CORRECTION
ECU_13	SYBELE_TURBO_PRESS	BOOST PRESSURE
ECU_14	SYBELE_POS_ELECT_TURBO	TURBO ELECTROVALVE POSITION
ECU_15	SYBELE_TPS_ELECT	ELECTRONIC THROTTLE POSITION
ECU_16	SYBELE_RICH	LAMBDA ENRICHMENT
ECU_17	SYBELE_DEBIM	INTAKE AIR FLOW (KG AIR/H)

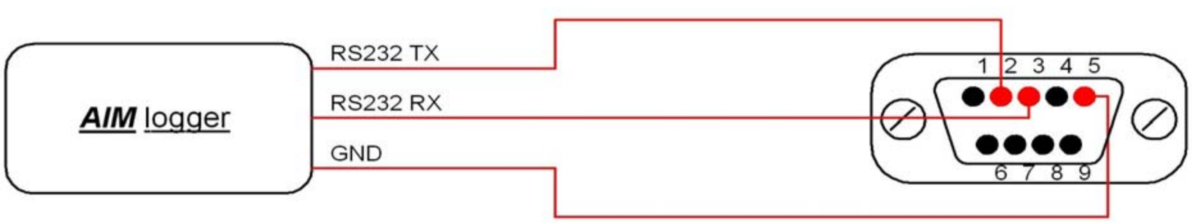
"WALBRO – BENELLI / BENELLI '04 / BIMOTA / HPUH1"

The ECUs are equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECUs themselves.

- **Connection With AIM Data logger**

AIM loggers can be connected to WALBRO ECUs via DB9 serial port according to the following wiring scheme:

- Connect the AIM cable labeled "RS 232 TX" with DB9 male Pin 2
- Connect the AIM cable labeled "RS 232 RX" with DB9 male Pin 3



WALBRO – A1BEN_00

ECU_1	RPM	RPM
ECU_2	MAP	MANIFOLD PRESSURE
ECU_3	TPS	THROTTLE POSITION

ECU_4	TAIR	INTAKE AIR TEMPERATURE
ECU_5	TENGINE	ENGINE TEMPERATURE
ECU_6	VBATT	BATTERY VOLTAGE
ECU_7	LAMBDA	LAMBDA VALUE
ECU_8	IDLEPOSITION	IDLE POSITION
ECU_9	DERIVTPS	THROTTLE POSITION DERIVATIVE
ECU_10	SIDE_STAND	SIDE STAND ON/OFF
ECU_11	NEUTRAL	NEUTRAL GEAR SIGNAL
ECU_12	MAPPA_ATTIVA	SELECTED ENGINE MAP
ECU_13	TIPO_OVER	TIP OVER SENSOR ON/OFF

WALBRO – A1BEN_04

ECU_1	RPM	RPM
ECU_2	MAP	MANIFOLD PRESSURE
ECU_3	TPS	THROTTLE POSITION
ECU_4	TAIR	INTAKE AIR TEMPERATURE
ECU_5	TENGINE	ENGINE TEMPERATURE
ECU_6	VBATT	BATTERY VOLTAGE
ECU_7	LAMBDA	LAMBDA VALUE
ECU_8	IDLEPOSITION	IDLE POSITION
ECU_9	DERIVTPS	THROTTLE POSITION DERIVATIVE
ECU_10	SIDE_STAND	SIDE STAND ON/OFF
ECU_11	NEUTRAL	NEUTRAL GEAR SIGNAL
ECU_12	MAPPA_ATTIVA	SELECTED ENGINE MAP
ECU_13	TIPO_OVER	TIP OVER SENSOR ON/OFF
ECU_14	SPEED	VEHICLE SPEED

WALBRO – BIMOTA

ECU_1	RPM	RPM
ECU_2	BAP	BAROMETRIC PRESSURE
ECU_3	MAP	MANIFOLD PRESSURE
ECU_4	KLAMBDA	FUEL CORRECTION FROM LAMBDA VALUE
ECU_5	INJ1	INJECTION TIME#1
ECU_6	INJ2	INJECTION TIME#2
ECU_7	SPARK1	SPARK ADVANCE#1
ECU_8	SPARK2	SPARK ADVANCE#2
ECU_9	PHASE	INJECTION PHASE
ECU_10	TPS	THROTTLE POSITION
ECU_11	DELTATPS	THROTTLE VARIATION DURING TRANSITION
ECU_12	TAIR	INTAKE AIR TEMPERATURE
ECU_13	TENGINE	ENGINE TEMPERATURE
ECU_14	VBATT	BATTERY VOLTAGE
ECU_15	LAMBDA	LAMBDA VALUE
ECU_16	LAMBDAREF	LAMBDA TARGET VALUE
ECU_17	IDLEPOS	IDLE POSITION
ECU_18	GEAR_AD_VAL	GEAR SENSOR ANALOG/DIGITAL VALUE
ECU_19	START_SWITCH	ENGINE STARTER

ECU_20	SIDE_STAND	SIDE STAND ON/OFF
ECU_21	NEUTRAL	NEUTRAL GEAR SIGNAL
ECU_22	ACTIVEBLOCK	IMMOBILIZER

WALBRO – HPUH1

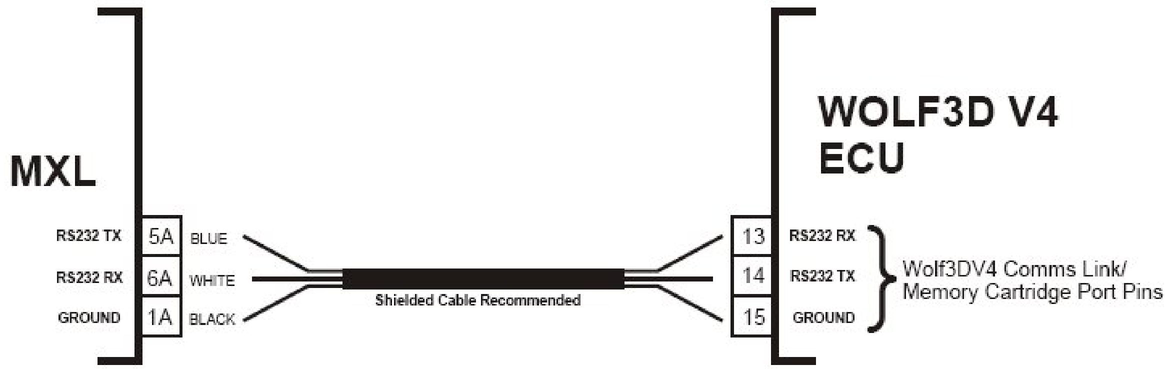
ECU_1	HPUH1_RPM	RPM
ECU_2	HPUH1_SPEED	VEHICLE SPEED
ECU_3	HPUH1_MAP	MANIFOLD PRESSURE
ECU_4	HPUH1_BAP	BAROMETRIC PRESSURE
ECU_5	HPUH1_TPS	THROTTLE POSITION
ECU_6	HPUH1_DELTATPS	THROTTLE VARIATION DURING TRANSITION
ECU_7	HPUH1_TAIR	INTAKE AIR POSITION
ECU_8	HPUH1_TENGINE	ENGINE TEMPERATURE
ECU_9	HPUH1_VBATT	BATTERY VOLTAGE
ECU_10	HPUH1_LAMBDA	LAMBDA VALUE
ECU_11	HPUH1_LAMBDAREF	LAMBDA TARGET VALUE
ECU_12	HPUH1_KLAMBDA	FUEL CORRECTION FROM LAMBDA VALUE
ECU_13	HPUH1_INJ1	INJECTION TIME#1
ECU_14	HPUH1_INJ2	INJECTION TIME#2
ECU_15	HPUH1_INJ3	INJECTION TIME#3
ECU_16	HPUH1_INJ4	INJECTION TIME#4
ECU_17	HPUH1_SPARK1	SPARK ADVANCE#1
ECU_18	HPUH1_SPARK2	SPARK ADVANCE#2
ECU_19	HPUH1_SPARK3	SPARK ADVANCE#3
ECU_20	HPUH1_SPARK4	SPARK ADVANCE#4
ECU_21	HPUH1_PHASE	INJECTION PHASE
ECU_22	HPUH1_IDLEPOS	IDLE POSITION
ECU_23	HPUH1_SIDE_STAND	SIDE STAND ON/OFF
ECU_24	HPUH1_NEUTRAL	NEUTRAL GEAR SIGNAL
ECU_25	HPUH1_ACTIVEBLOCK	IMMOBILIZER
ECU_26	HPUH1_TIPOVER	TIP OVER SENSOR ON/OFF

"WOLF – 3D"

The ECUs are equipped with a serial communication interface (RS 232) used to communicate parameters to an external data logger, or to configure the ECUs themselves.

- **Connection With AIM Data logger**

AIM loggers can be connected to WOLF ECUs via DB9 serial port according to the following wiring scheme:



WOLF – WOLF3D

ECU_1	WOLF_RPM	RPM
ECU_2	WOLF_LOAD	ENGINE LOAD
ECU_3	WOLF_TURBOP	BOOST PRESSURE
ECU_4	WOLF_MAP	MANIFOLD PRESSURE
ECU_5	WOLF_INJT	INJECTION TIME
ECU_6	WOLF_INJ_DC	INJECTOR DUTY CYCLE (0-100%)
ECU_7	WOLF_IGNANG	IGNITION ADVANCE ANGLE
ECU_8	WOLF_TPS	THROTTLE POSITION
ECU_9	WOLF_AIRT	INTAKE AIR TEMPERATURE
ECU_10	WOLF_ENGT	ENGINE TEMPERATURE
ECU_11	WOLF_OXYGEN	LAMBDA RAW VOLTAGE
ECU_12	WOLF_BATT	BATTERY VOLTAGE
ECU_13	WOLF_IDLE_VALVE	IDLE VALVE POSITION
ECU_14	WOLF_NOISE	FALSE SIGNALS COUNTER
ECU_15	WOLF_AFR	AIR/FUEL RATIO
ECU_16	WOLF_ERR	ERROR SIGNAL